Getting Started with Catalyst V4 Software

Copyright ©2006 High End Systems, Inc. All rights reserved.

Information and specifications in this document are subject to change without notice.
High End Systems, Inc. assumes no responsibility or liability for any errors or inaccuracies that may appear in this manual.

Trademarks used in this text: High End Systems, Catalyst, the Catalyst Logo, Wholehog III, and LithoPatterns are registered trademarks; and Talkback, the High End Systems globe logo, and the Hog logo are trademarks of High End Systems, Inc. or High End Systems Europe Ltd. Belden is a registered trademark of Belden, Inc. Apple, Final Cut Pro, Finder, FireWire, Mac, Mac OS, MacPaint, PowerMac, and QuickTime are trademarks of Apple Computer, Inc., registered in the United States and other countries. Adobe, Photoshop, and Premiere are registered trademarks of Adobe Systems, Inc. Extron is a registered trademark of Extron Electronics. Leitch is a registered trademark of Leitch Technology Corporation. Sony is a registered trademark of Sony. Radeon is a registered trademarks of ATI Corporation in the United States and /or other countries. Macromedia is a registered trademark and Flash is a trademark of Macromedia, Inc. ETL and C-ETL are registered trademarks of Intertek Testing Services. Omega Deck is a trademark of Fast Forward Video, Inc. Artnet is a trademark of Artistic Licence Ltd .

Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. High End Systems disclaims any proprietary interest in trademarks and trade names owned by others.

High End Systems
2105 Gracy Farms Lane
Austin, Texas 78758

Table of Contents

Introduction

What's New in Catalyst V4 Software 1
- Expanded Capabilities 1
- New Features 1

Catalyst Software Versions 1

Contacting High End Systems 2

Upgrading to Catalyst Version 4.0 Software

- Check Your Hardware 3
- Contact High End Systems for a New Dongle Code 3

Upgrading the Catalyst Application 3
- Download Catalyst V4 Software 3
- Upgrade the Catalyst Dongle Version 4 3
- Update Content Files: 4

Navigating Catalyst Version 4.0 Interface

Using the Full Screen Mode 6
- HUD (Heads Up Display) Buttons 7
- Updated Layer Editing 7

Expanded Preset Capability 10

Using the Cue List Feature 12
- Placing Presets in a Cue List: 12
- Setting Timing 13
- Other Cue List Management Functions 13
  - Show Cue 13
  - Cue Lists Options 13
  - Play Next 14
- Reordering a Cue List 14
- Deleting a Cue from the Cue List 14
- Saving a Cue List 14
- Loading a Show 14
- Deleting Cuelist 14
- Adding Show Control Elements to the Cue List 15

Configuring and Mapping Output to LED Devices 17

Expanded Effects 18
- New Visual Effects 18
- Editable Gamma Color Effects 18

Accessing a Remote Catalyst Media Server 19
- Using the Web Server Feature 19
- Info Tab 20
- Status Tab 20
- Layers Tab 21
- Presets Tab 21
- File Tab 22
- Colour FX and Visual FX Tabs 22

Appendix A: PixelMAD Manual 23

Introduction

What's New in Catalyst V4 Software

Catalyst V4 software from High End Systems uses the same number of DMX channels and is backward compatible with Catalyst V3.3. It is also fully compatible with Mac OS 10.4 (Tiger). Catalyst V4 software expands V3.3 functionality and adds new features and device support.

Expanded Capabilities

Two More Layers for Pro, DV and XPress Products: Additional Layers provide greater programming and design flexibility.

Control Hardware Support: Catalyst V4 supports Mackie control hardware, with flying faders, parameter editing and preset recall as well as other midi devices including Behringer BCF2000 and midi keyboards.

More Content Support: In addition to Quicktime supported formats, Catalyst V4 can accept files created in Quartz Composer and 3-D .obj files.

Editable Gamma Color Effects: Catalyst V4 software uses a curves editor to let you edit brightness contrast, knee, white point, and blackpoint.

More Visual Effects: New effects include multiple Shutters, Waves, Pixelize, better kaleidoscope, and Cropping.

New Features

Standalone Operation: Updated user interface allows complete standalone operations in new full screen mode – including cue list and show control

Remote Configuration and Triggering: Web Server lets you access, configure and trigger Catalyst Media Servers remotely.

Support for DMX LED fixtures: Multiple sub mixes – allows layers to be independently assigned to LED fixtures, LED wall controllers or projectors at the same time.

Catalyst Software Versions

High End Systems offers three Catalyst software products:

- Catalyst Pro offers ten editable layers with two video feeds from one server.
- Catalyst DV is a dual digital output solution with six cross-fadable layers.
- Catalyst Xpress is a software only product with 2 movie layers, 1 mask layer and a single output.

Choosing the right version of Catalyst software will depend on the number of layers, inputs and outputs you will need and your performance requirements.

The following matrix compares each version's feature set.

Feature	Pro	DV	Xpress
Dual Output	Yes	Yes	No
Single Output	Yes	Yes	Yes
Total number of layers	10	6	4
PixelMAD Universes	5	2	2
Sub-mixes	4	3	2
Video Inputs	2	2	1
MIDI Show Control Input	Yes	Yes	Yes
Serial Control Devices	6	3	0
RS422 Control Devices	4	2	0
MIDI Timecode Input	Yes	Yes	No
Presets	Yes	Yes	Yes
Movie Audio Support	Yes	Yes	Yes
Turnkey or Software Only Version	Both	Software only	Software only

Note: Product specifications are subject to change without notice

Contacting High End Systems®

Sales Department

High End Systems, Inc.
2105 Gracy Farms Lane
Austin, TX 78758 USA
voice: 512.836.2242
fax: 512.837.5290
Toll Free: 800.890.8989

Customer Service

High End Systems, Inc.
2105 Gracy Farms Lane
Austin, TX 78758 USA
voice: 800.890.8989
fax: 512.834.9195
toll free: 800.890.8989
email: support@highend.com

World Wide Web: http://www.highend.com

Upgrading to Catalyst Version 4.0 Software

Before you download the Version 4.0 Upgrade, you'll need to verify that your hardware will support optimum performance and obtain a new dongle code.

Check Your Hardware

Catalyst V4 software works on both Mac OS 10.3.9 (Panther) and 10.4.4 (Tiger). However, good performance on systems running Tiger will require 1GB RAM.

The High End Systems website lists other recommended hardware components for your Catalyst system [http://www.highend.com/support/digital_lighting/].To troubleshoot any of these components outside of its use with Catalyst software, contact the manufacturer.

Contact High End Systems for a New Dongle Code

Contact your High End Systems Inside Sales Representative Via email or phone to give them your Dongle ID and serial number. If you purchased your server from HES, please be ready to include the server ID and serial number. You will receive your new code via email.

Upgrading the Catalyst Application

Software upgrades for Catalyst Pro, Catalyst DV, and Catalyst XPress products all install using the same simple steps.

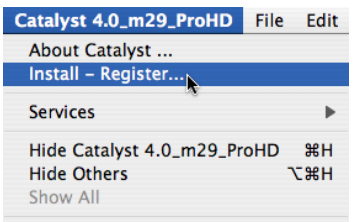
Download Catalyst V4 Software

1. Go to the High End Systems website at: [http://www.highend.com/support/digital_lighting/] and click on the download link for your Catalyst product.

Before downloading the Catalyst V4 Software to your server, ensure that the Catalyst dongle is NOT connected to any USB port.

Upgrade the Catalyst Dongle Version 4

2. Insert your dongle into a USB slot on your G5 computer
3. Open up the Catalyst V3 application
4. Select **Install–Register** from the Catalyst menu. A window will open with information about your serial number and dongle code.
5. Go to the email you received containing your new V4 Dongle Code and copy the code onto your clipboard.



6. Return to the Install---Register window and click on the **Enter Code** button to automatically paste the code into the Dongle Code Box.
7. Click on the **Refresh** button. Catalyst V3 will no longer be able to find the dongle.

8. Open the Catalyst V4 application
9. Select **Install–Register** from the Catalyst menu to open the Install---Register window.
10. Press **Refresh** and the dongle will appear in the Install---Register window as a Catalyst V4 dongle.

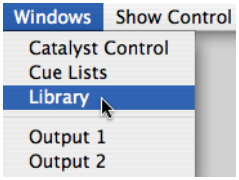
Note: ***If you need to convert the dongle back to the Catalyst V3 application, follow the same instructions, making sure to swap which application version you have open.***

Trouble shooting Dongle Upgrading

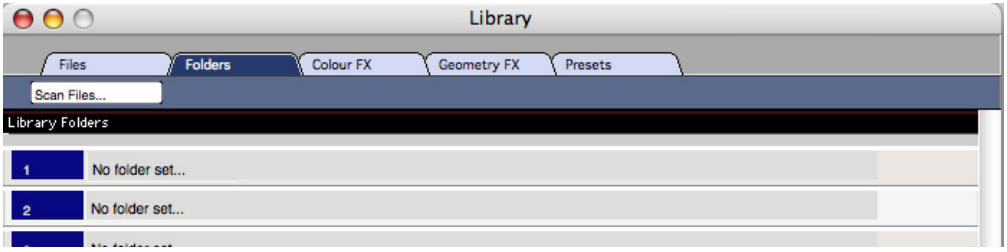
If you are having trouble getting your dongle to upgrade or be seen by the application:

- Make sure you're dongle driver is still installed and re-install if necessary.
- Test the USB drive on your computer with other USB devices. If you are using a USB card then it's possible the card is no longer good or it came loose and needs to be re-seated.
- If you have multiple dongles, make sure each dongle matches its specific dongle Code.

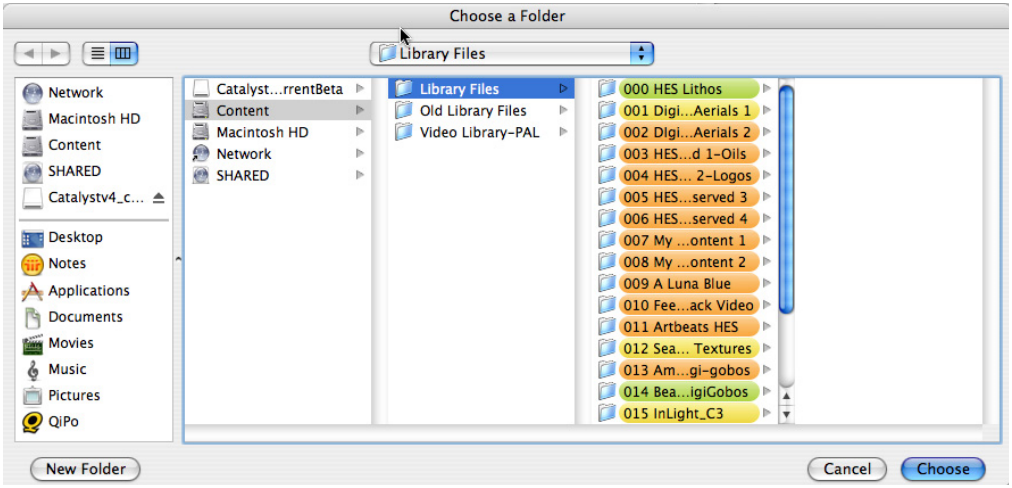
Update Content Files:



11. With the Catalyst V4 application open, select **Library** from the Windows menu.
12. Click on the Folders tab. The folders will show as empty.



13. Click on Library #1. A File Navigation window will open. Navigate to your content file folders and click **Choose** to select.

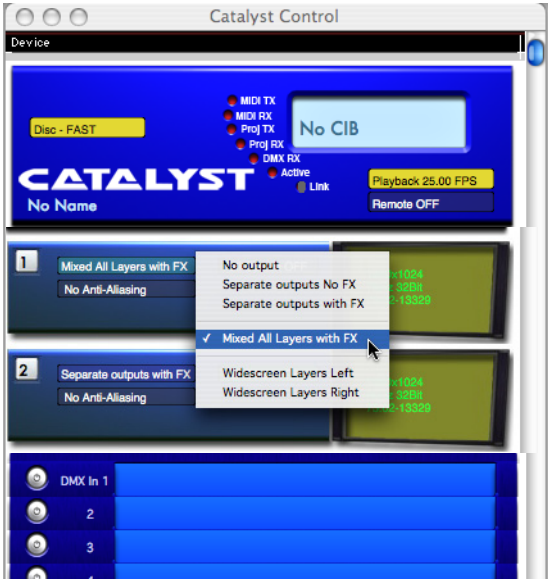


Navigating Catalyst Version 4.0 Interface

When you first start up the catalyst software you will see windows that look similar to Catalyst V3.3. There is a Catalyst control window where you can change your output configuration, Set DMX Start for content layers, live feed in boxes, and other control panels.

You'll also see the Output 1 and 2 windows. Catalyst V4 provides output preview functionality in the full screen mode instead of using the Output windows.

The layer configuration that was part of the Layer Configuration panel in the Catalyst Control window is now included as a HUD screen for each layer to allow maximum flexibility for viewing output. Output configurations (layer combinations with or without effects) that were selected in the output panel of the Catalyst control window are now integrated into the layer editing panel.



Output 1 can be previewed on you main monitor and Output 2 on a secondary monitor.

Catalyst V4 software features standalone operation in full-screen mode with full preview. The new graphical user interface controls:

- Full Layer editing
- Multiple on-screen patchable mixes that can be sized, moved and locked into position
- Live Color and Visual effects preview

Using the Full Screen Mode

To view output configuration and edit layers in the Catalyst V4 interface:

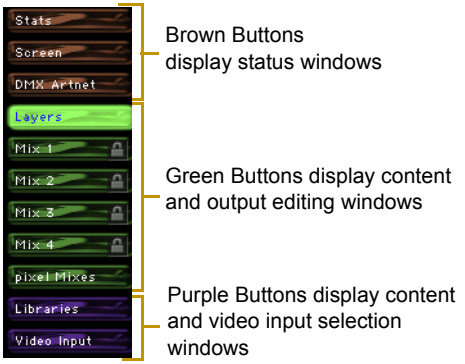
1. Select full screen mode either in the Catalyst control window or by using hotkeys. Hotkeys function the same as in Version 3.3 except that the HUD buttons in full screen mode eliminate the need to scroll through diagnostic screens with hotkeys. You can also access a hotkeys keyboard reference in the **Windows** drop down menu at the top of your screen.
2. Ensure that the layers you want to preview are mapped to mix 1 for output 1 and mix 2 for output 2

Output	Hotkey	Action
1	Q	Hide HUD buttons
	W	Show HUD buttons
	A	Full screen on
	S	Full screen off
2	D	Full screen on
	F	Full screen off
	Z	Hide HUD buttons
	X	Show HUD buttons

HUD (Heads Up Display) Buttons

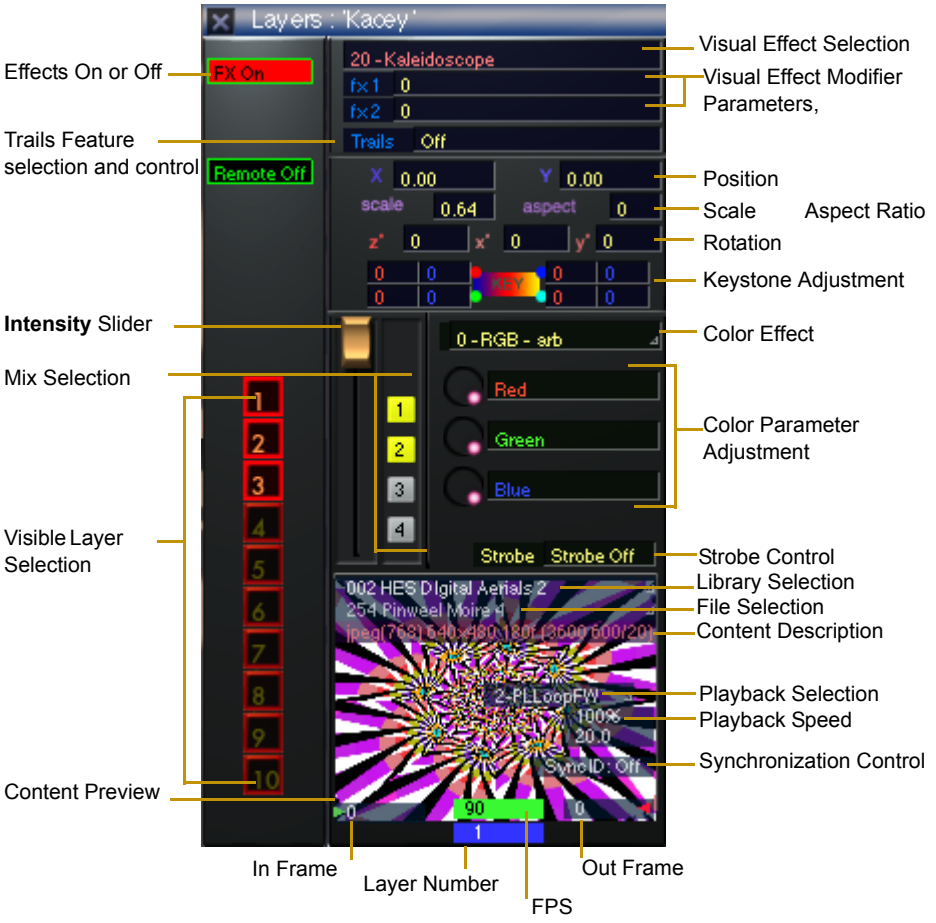
HUD screens were used to diagnostic information in Catalyst V3.3. Version 4 expands their function to configuration and control of Layer Editing, Mixes, Pixel Mixes, and content selection.

Once you enter the full screen mode, you'll see HUD buttons at the bottom left of the screen. These buttons open all the HUD windows.



Updated Layer Editing

Layer editing now takes place in the onscreen layer window. All parameters are viewable at the same time. The Layer Edit panels have live preview of images on that layer- with or without effects applied. Click on the Layer HUD button to open the Layer Editing panel. Click on the layer number list on the left side of the window to choose which layers to display for editing.



The Name indicated in the layer manipulation window title bar, can be changed in the catalyst control window when full screen mode is off. Click on the Name field, type a new name and then press <Enter>.

Effects On or Off: Clicking the button toggles between FX On and FX Off. FX On displays the effects you apply as part of the Content Preview at the bottom of the panel.

Trails: To apply Trails effect, click and drag up or down to adjust trail intensity.

Mix Selection: These buttons correspond to mixes 1, 2, 3, and 4. For example, if you press the Mix 1 button in the layer one window, that means that the content in layer one will be

mapped to Mix one. If you press the Mix 3 and 4 button in the Layer 7 edit window, any content in layer seven will be shown in Mixes 3 and 4.

Rotation Parameters: X, Y, and Z indexing and rotation parameters. Use your mouse to click on the X, Y or the Z or the value next to them and then slide your mouse up or down to change the DMX value. The DMX value has to be above a value of 720 before the layer will start rotating.

Keystone Adjustment: In order for keystone to work you need to select Keystone 1 from the effects drop down menu in the Visual Effects field. Then you can click on the Red or blue DMX values and drag up or down to change them. The red DMX values move the corner of the layer in the X direction and the blue DMX values move the corner of the layer in the Y direction.

Color Effects: Use your mouse to select this label and a drop down menu will appear. From this menu you can select different color effects.

Color Parameters: Three dials control Red Green and Blue adjust color mixing parameters. Click on the name of the color or the dial next to it and drag the mouse up and down to change the DMX value.

Strobe Control: Click on the field and drag up or down to set a strobing type and rate.

Intensity Control: Click and drag slider up and down to change a layer's.

Library Selection : Click on this field for a list that allows you to select a library folder.

Library File: Click in this field for a list that allows you to choose a library file.

Playback Selection: Click for a list of playback modes for selection

Playback Speed: This value defaults to 100% which equals "normal" speed. Clicking and dragging up on this value changes the playback speed from slower to faster.

Sync ID : A drop down list lets you select a server ID for content synchronization.

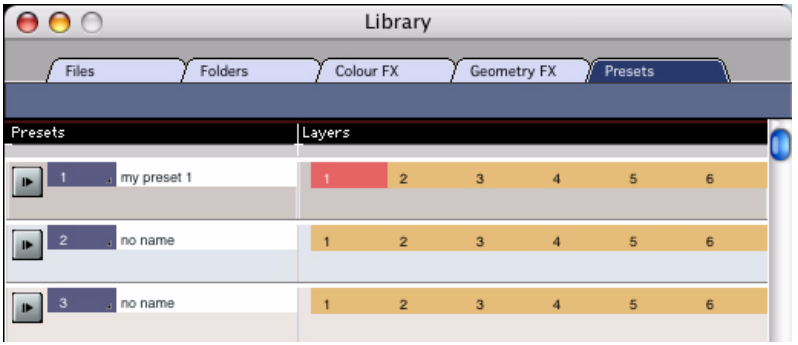
FPS: Displays the frames per second playback for the content running on that layer.

In Frame and Out Frame: Click on the 0 and drag it up or down to change the in and out frames of the content.

Expanded Preset Capability

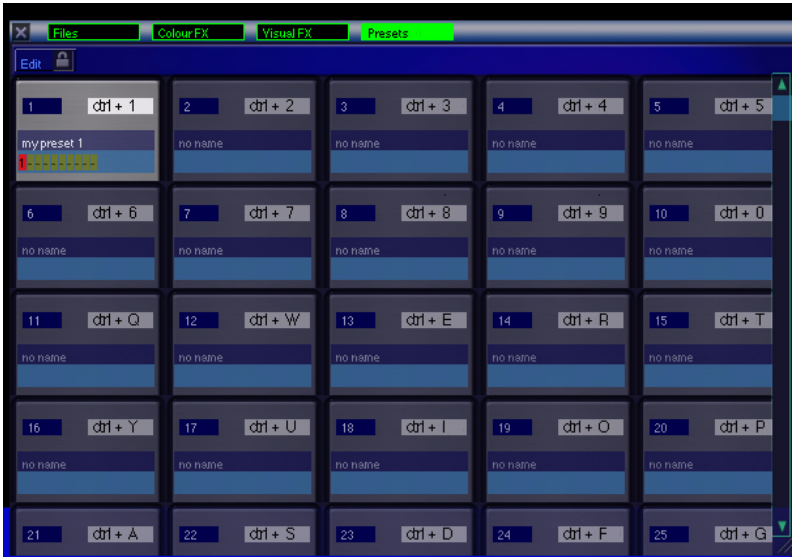
Catalyst version 4 expands the preset editing and playback functionality that debuted in Catalyst version 3.3 *(see Chapter 18: Presets* in the *Catalyst V3.3 User Manual*).

- Presets created in the presets editor located on the Library window have a new icon to the left of each preset. You can click this icon and drag a Preset into a Cue List. See the section on Cue Lists for more information.

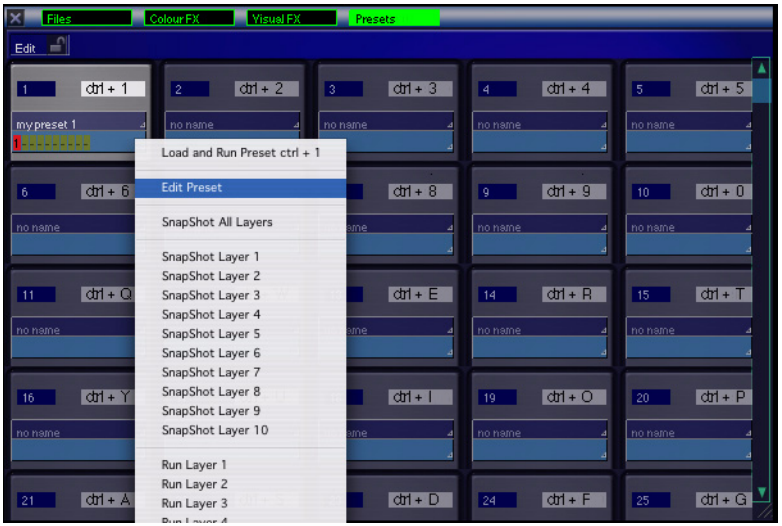


- Catalyst V4 doubles the number of Presets you can create to 400.
- You can now use the following steps to create and edit Presets in full screen mode.

1. Use the Hotkeys to turn Full Screen On and open the HUD (A and W for Output 1, D and X for Output 2).
2. Select the **Libraries** button from the HUD and click on Presets tab


Files
Colour FX
Visual FX
Presets
Edit
1 ctrl + 1 my preset 1
2 ctrl + 2 no name
3 ctrl + 3 no name
4 ctrl + 4 no name
5 ctrl + 5 no name
6 ctrl + 6 no name
7 ctrl + 7 no name
8 ctrl + 8 no name
9 ctrl + 9 no name
10 ctrl + 0 no name
11 ctrl + Q no name
12 ctrl + W no name
13 ctrl + E no name
14 ctrl + R no name
15 ctrl + T no name
16 ctrl + Y no name
17 ctrl + U no name
18 ctrl + I no name
19 ctrl + O no name
20 ctrl + P no name
21 ctrl + A
22 ctrl + S
23 ctrl + D
24 ctrl + F
25 ctrl + G

3. Click on an existing preset to playback (same process as Catalyst version 3.3). Click in the **Edit** field to unlock Presets

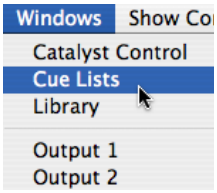


4. Click and hold in the field below the name of any preset to create preset or open preset editor (for info on editing presets, see *Chapter 18: Presets* in the *Catalyst V3.3 User Manual*).
5. Click **Edit** again to lock a preset and disable editing.

Using the Cue List Feature

Presets must be created in the library window just as they were in Catalyst V3.3. These presets can then be executed with hot keys just as they were in Catalyst V3.3 or they can be put into a Cue List.

Placing Presets in a Cue List:



Select Cue List from the Window menu. Keep your library window open with Preset tab selected. Use the gray button next to preset number to drag and drop any of the presets you created into the Cue List window. If you named the preset, the name will follow it to the Cue List and will be displayed in the **Command** column.

Selecting a Preset in the **Command** column opens a drop down menu that lists all of the Presets you have created along with Preset numbers still available and allows you to edit the Preset selection.

The preset window allows for up to 400 individual presets. You can, however, repeat a Preset in the Cue List multiple times.

The **Comment** column lets you enter descriptive notes for a Preset

Setting Timing

Set the time you want a cue to execute in the **Time** column. Select a number, change it, and click <Enter>. Clicking the double line symbol in the **Wait** column next to a Preset, lets you pause playback, and will not advance past a "paused" cue.

A series of buttons direct playback:

Record records the Cue List

Play starts the clock and the Cue List.

Stop stops the clock and keeps any remaining cues in your list from executing.

Reset runs the clock back to the start time of the cue list.

Other Cue List Management Functions

Once you have created a Cue List, you can set other navigation and labeling features.

Show Cue

You can number/label your cues in the **Show Cue** column. Simply select the desired cue with your mouse in the show cue column. A box will appear for you to number or label your cue as desired. Press <Enter> to complete accept.

After a cue has been numbered or labeled, that label will appear in the **GOTO** drop down menu. To navigate quickly to a particular cue just select the desired cue in the GOTO drop down menu. Alternatively you can press the GOTO button and type the name or number of the desired cue into the box that appears, then click O.K. to navigate to the cue.

Cue Lists Options

Clicking on the Options... button will open a display where you can:

- rename and renumber the cue list
- change the clock source
- choose to lock play and stop to your input device
- stop the clock after the last cue, hold the current cue at the top of the list
- auto play cue list when loaded
- display the timeline

Play Next

Selecting a cue by clicking in the far left column will display a red dot. This dot indicates which cue is going to be played next when you start Cue List playback. This dot does not indicate which cue is currently being played.

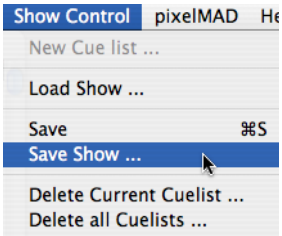
Reordering a Cue List

To reorder a Cue List, use the mouse to click and hold on the cue you want to move within the cue list. With the cue selected, press the <Option> button on your keyboard. You can now drag the cue up and down in the cue list. A blue line will appear to indicate where in list the cue is going to land when you let go of your mouse button.

Deleting a Cue from the Cue List

Select the desired cue in the **Select** column of the cue list (the box will select box will turn blue), and press the <Delete> button on your keyboard.

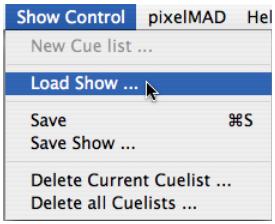
Saving a Cue List



Once you have created your cue list you need to save it. This can be done in the Show Control drop down menu located at the top of the catalyst application and select **Save Show...** to open a window that allows you to name the show and to locate it on your hard drive.

Once you have initially saved the show, you can select **Save** from the Show Control menu to save changes you make to your cue list while you work.

Loading a Show



If you want to load a show you have already created, select **Load Show...** in the Show Control drop down menu. You can load any show that you have previously saved.

*NOTE: The cues in a Cuelist only reference the Presets you have created. Loading a show **does not** copy the Presets you used to create the Cuelist into that show. A deletion or change to a Preset will be reflected in every Cuelist that references it.*

Deleting a Cuelist

The Show Control menu also has options to *Delete Current Cuelist* or *Delete all Cuelists*.

Adding Show Control Elements to the Cue List

The Cuelist can support various 'show control' elements as well as Presets. Show Control elements include Midi Show Control output, RS232 Commands and RS422 Deck Control commands.

MSC Window

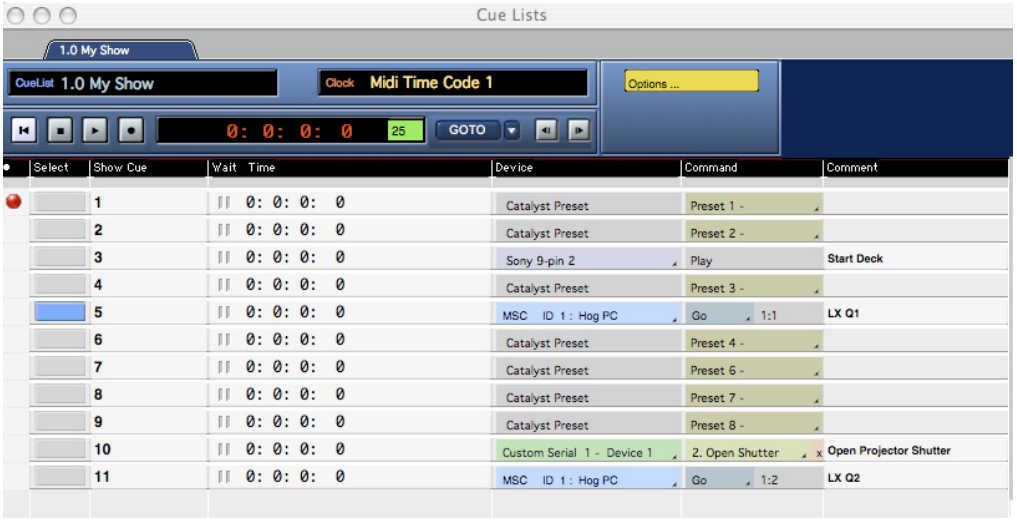
Custom Serial Window

RS422 Window

The MSC, Custom Serial and RS422 windows feature buttons which can be 'dragged and dropped' into the Cue List window to form Show Control cues.

RS422 and Custom serial are covered in the v.3.3 manual. Midi Show Control is covered in detail in John Huntingdon's Control Systems for Live Entertainment (2nd Edition)

Example: Cue List featuring RS422, serial and MSC cues:


Cue Lists
1.0 My Show
CueList 1.0 My Show
Clock Midi Time Code 1
Options ...
0: 0: 0: 0
25
GOTO
Select
Show Cue
Wait Time
Device
Command
Comment
1 0: 0: 0: 0 Catalyst Preset Preset 1 -
2 0: 0: 0: 0 Catalyst Preset Preset 2 -
3 0: 0: 0: 0 Sony 9-pin 2 Play Start Deck
4 0: 0: 0: 0 Catalyst Preset Preset 3 -
5 0: 0: 0: 0 MSC ID 1 : Hog PC Go 1:1 LX Q1
6 0: 0: 0: 0 Catalyst Preset Preset 4 -
7 0: 0: 0: 0 Catalyst Preset Preset 6 -
8 0: 0: 0: 0 Catalyst Preset Preset 7 -
9 0: 0: 0: 0 Catalyst Preset Preset 8 -
10 0: 0: 0: 0 Custom Serial 1 - Device 1 2. Open Shutter Open Projector Shutter
11 0: 0: 0: 0 MSC ID 1 : Hog PC Go 1:2 LX Q2

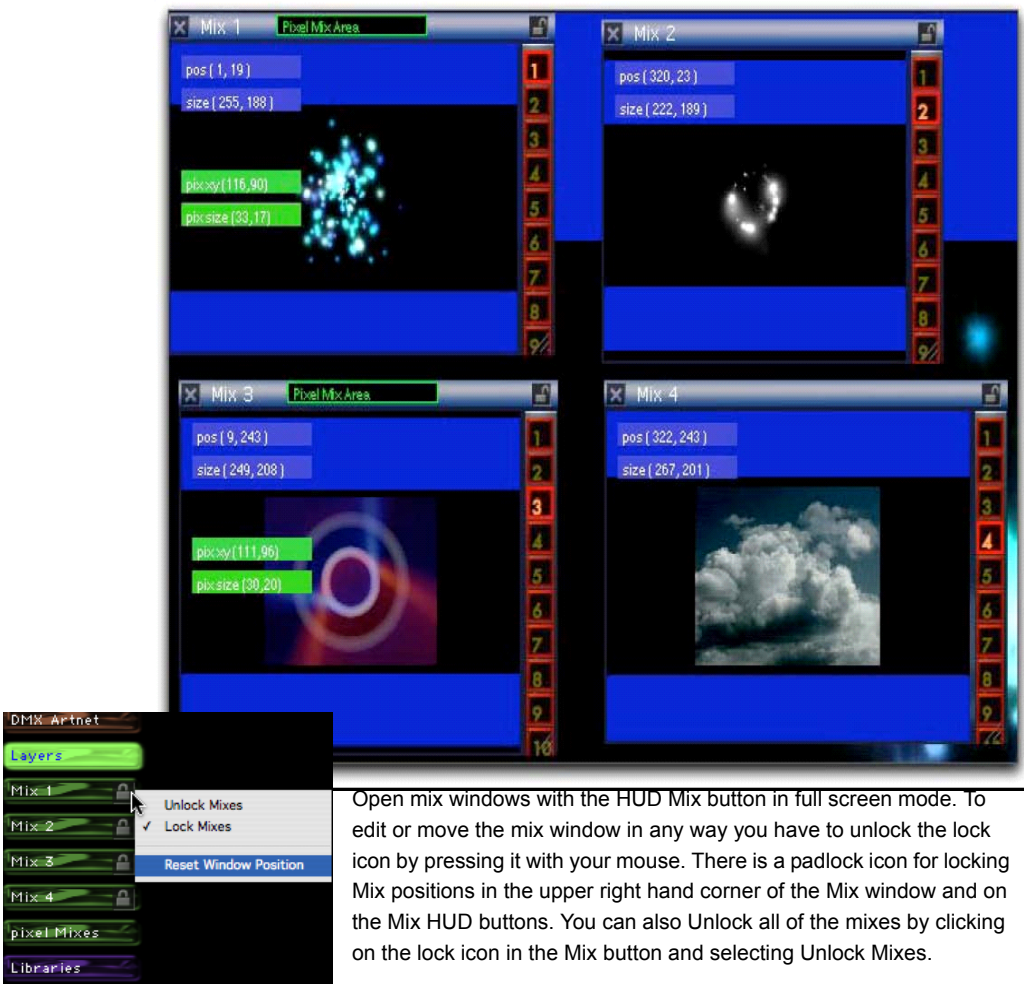
Configuring and Mapping Output to LED Devices

Catalyst Version 4 now offers integrated support for pixelMAD functionality that allows you to:

- Output to LED DMX fixtures from multiple on-screen mixes.
- Designate different areas of an LED fixture to display up to four different mixes.
- Plug-in upgrade to 30 universes of DMX.

After you patch content from selected layers to a Mix window, you can select a portion of the content displayed in you monitor to map to a specific area of your lighting setup using the pixelmixes HUD.

You can find a detailed description and examples for the pixelMAD functionality in Appendix A. (*pixelMAD Manual,* reprinted by permission from SamSC Designs Ltd)



Open mix windows with the HUD Mix button in full screen mode. To edit or move the mix window in any way you have to unlock the lock icon by pressing it with your mouse. There is a padlock icon for locking Mix positions in the upper right hand corner of the Mix window and on the Mix HUD buttons. You can also Unlock all of the mixes by clicking on the lock icon in the Mix button and selecting Unlock Mixes.

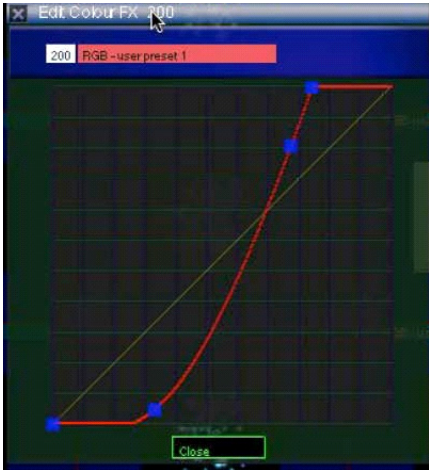
Expanded Effects

New Visual Effects

- New Visual effects include Shutters, Waves, Pixelizing, Kaleidoscope, and cropping.
- Model effects maps content onto simple 3-D object (.obj) files.

Editable Gamma Color Effects

Editable gamma color effects uses a curves editor to adjust brightness, contrast, knee, white point, and blackpoint.



Accessing a Remote Catalyst Media Server

Catalyst V4 has a new web server feature that allows remote connections for diagnostics, control and preview. In addition to monitoring any Catalyst V4 Media Server running on your networked environment, you can:

- Preview Layer parameter settings (see *Layers Tab*)
- Update Content Files, (see *File Tab*)
- Trigger Presets, (see *Presets Tab*)
- Send Restart, Shutdown and Sleep Commands, (see *Info Tab*)

Using the Web Server Feature

To access a remote Catalyst Media Server:

1. Select Catalyst Control from the Windows menu and scroll down to view the "WWW Remote" panel.

2. The topmost area of the WWW Remote panel shows the web address (IP address and port #) used for accessing the web server. For example, if it says "Waiting for connections to 10.0.2.146 Port 8080 http", type http://10.0.2.146:8080 in a web browser on a different computer that shares the same network.

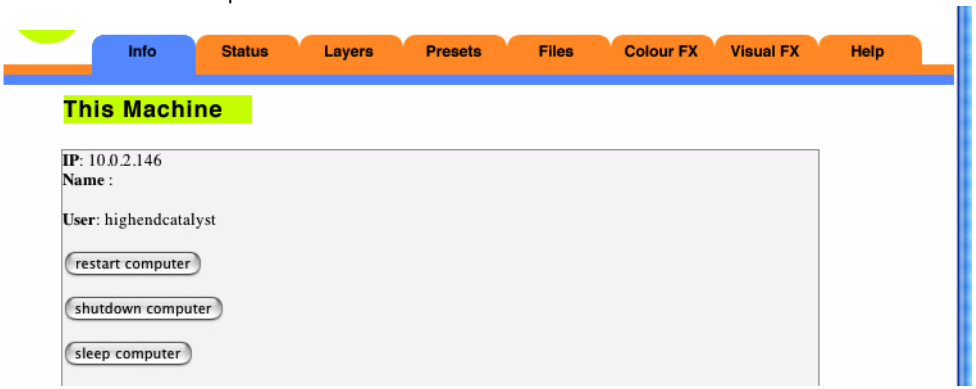
Note: ***If the URL to your catalyst server does not load, verify on the catalyst server that the Firewall is turned off. This setting is in System Preferences > Sharing > Firewall tab.***

If the Firewall must be on in your environment due to your requirements, click New... in the Firewall tab area (turn Firewall off temporarily to do this, and define and new exception named "Catalyst V4" with port 8080 and reenable the firewall.

Info Tab

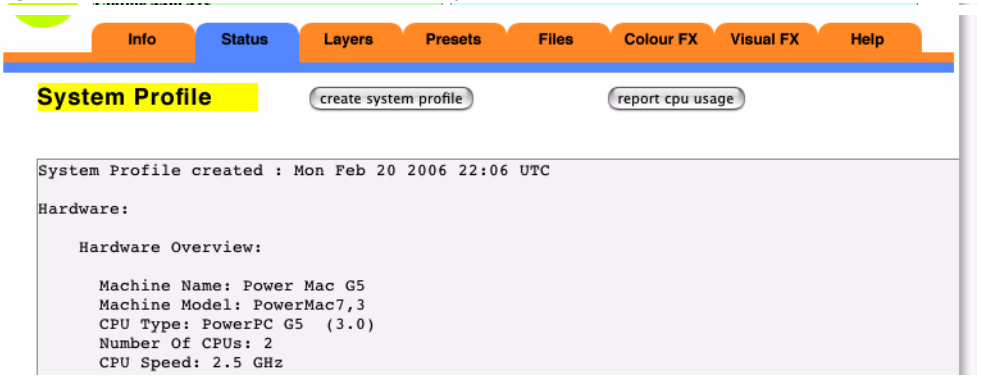
Once the web page to the server loads successfully, you can choose to execute any of the following commands from the Info tab.

- Restart computer
- Shutdown computer
- Sleep computer
- Goto full screen output 1
- Exit full screen output 1
- Goto full screen output 2
- Exit full screen output 2



Status Tab

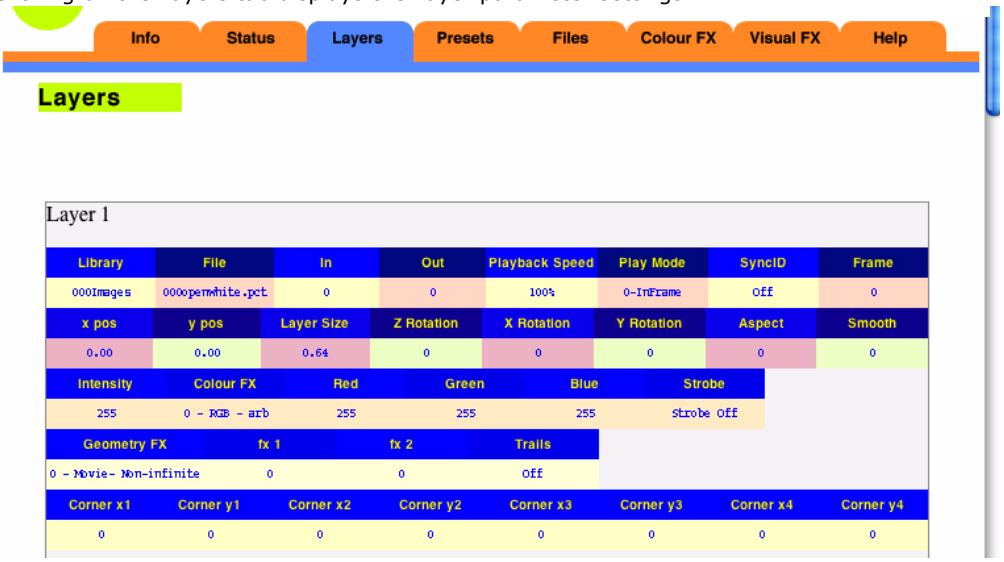
The **Status** Tab allows you to create a system profile or monitor CPU usage. These are useful diagnostic tools in the event of a service request.



Note: After clicking either button, you should wait a few minutes and then refresh the web page to show the info.

Layers Tab

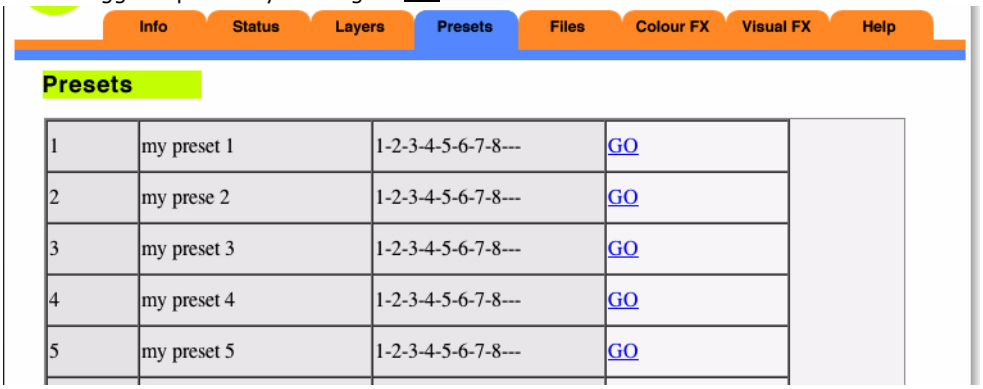
Clicking on the Layers tab displays the Layer parameter settings.



Presets Tab

Clicking on the Presets tab lets you view the list of any presets that have previously been defined via the Preset editor.

You can trigger a preset by clicking its **GO** link.

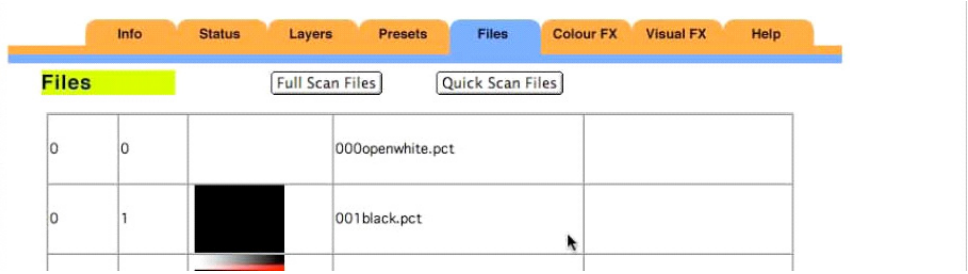


File Tab

The File tab lets you view content files that have previously been defined and send Scan Files commands.

When new files are added to any and defined content locations, clicking the **Full Scan Files** or **Quick Scan Files** updates the list of content files for Catalyst V4 use.

Note: ***These actions can take several minutes to complete, so refresh this web page as needed.***



Colour FX and Visual FX Tabs

Clicking on the Colour FX or Visual FX tabs displays a reference for all the color and visual effects available in the Catalyst V4 application.

Appendix A: PixelMAD Manual

PixelMAD documentation is reprinted on the following pages by permission for users of Catalyst Media servers to describe the SubMix and Pixelmix features embedded in the Catalyst V4 software.

Manual

© SAMSC Designs Ltd 2005
7th December 2005. rev15

pixelmad support http://www.catvx.com/

Contents

MANUAL **1**

CONTENTS 2
CHAPTER 1 - INTRODUCTION 3
WORKFLOW 4
EXAMPLES 8
CREATING THE LIGHTING DIAGRAM. 8
CHOOSING AND MIXING YOUR IMAGES 12
FILE PARAMETERS 17
COLOUR PARAMETERS 18
SHAPE PARAMETERS 18
SELECTING THE OUTPUT MIX 19
MAPPING YOUR IMAGES ONTO THE LIGHTING FIXTURES. 22
CHAPTER 2 – ORGANISING QUICKTIME MOVIES 37
CHAPTER 3 – ARTNET GETTING DATA TO FIXTURES 42
CONFIGURING ETHERNET & ARTNET 42
CONFIGURING DMX COMMUNICATION 45

Chapter 1 - Introduction

pixelMAD is Macintosh software that allows the lighting designer to transform and store moving and still images and then cue and play them across groups of DMX lighting fixtures and low resolution video displays.

Source images are transformed using a range of parameters such as shape, position, colour, intensity and speed.
pixelMAD plays back movies and displays images in visual layers. These layers can be mixed to create new images.

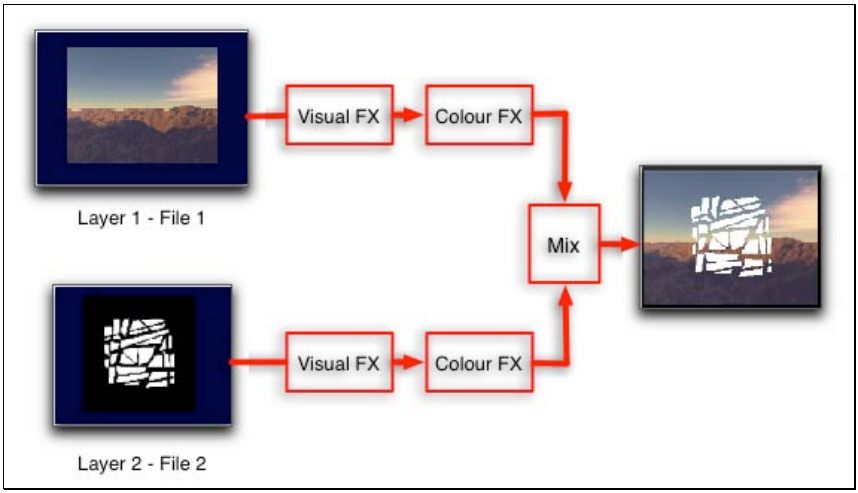


Figure 1 - Mixing images.

The final image mixes created in pixelMAD are then mapped to the lighting set up so that each lamp displays one pixel of the mixed image. In this way the DMX fixture colour and intensity level is controlled directly from the video image.

Depending on the number of fixtures used and their grouping the result can be either an abstract array of patterns and movements or an image of a recognisable object.

Workflow

When the application is first run the CONTROL WINDOW comes up. Here you can set the preferences for the screens, assign the DMX channels and set video and audio input preferences.

Figure 2 - pixelMad Control Window.

To get access to the other windows in pixelMAD you must enter FULL SCREEN MODE.

To put the screen into FULL SCREEN MODE press –

To get back to the CONTROL WINDOW press –

Once you are in FULL SCREEN MODE press -

This turns on the HUD – The “heads up display” which gives you access to the rest of the software.

Figure 3 - Full Screen Mode.

Figure 4 – HUD.

Click on LIBRARIES to choose your footage and visual effects.

Click on LAYERS to open the window for mixing and manipulating images.

Click on MIX 1 – 4 to view your image mixes.

Click on PIXEL MIXES to place the image mixes on a graphic representation of your lighting set up and see how the image will look on the lighting fixtures.

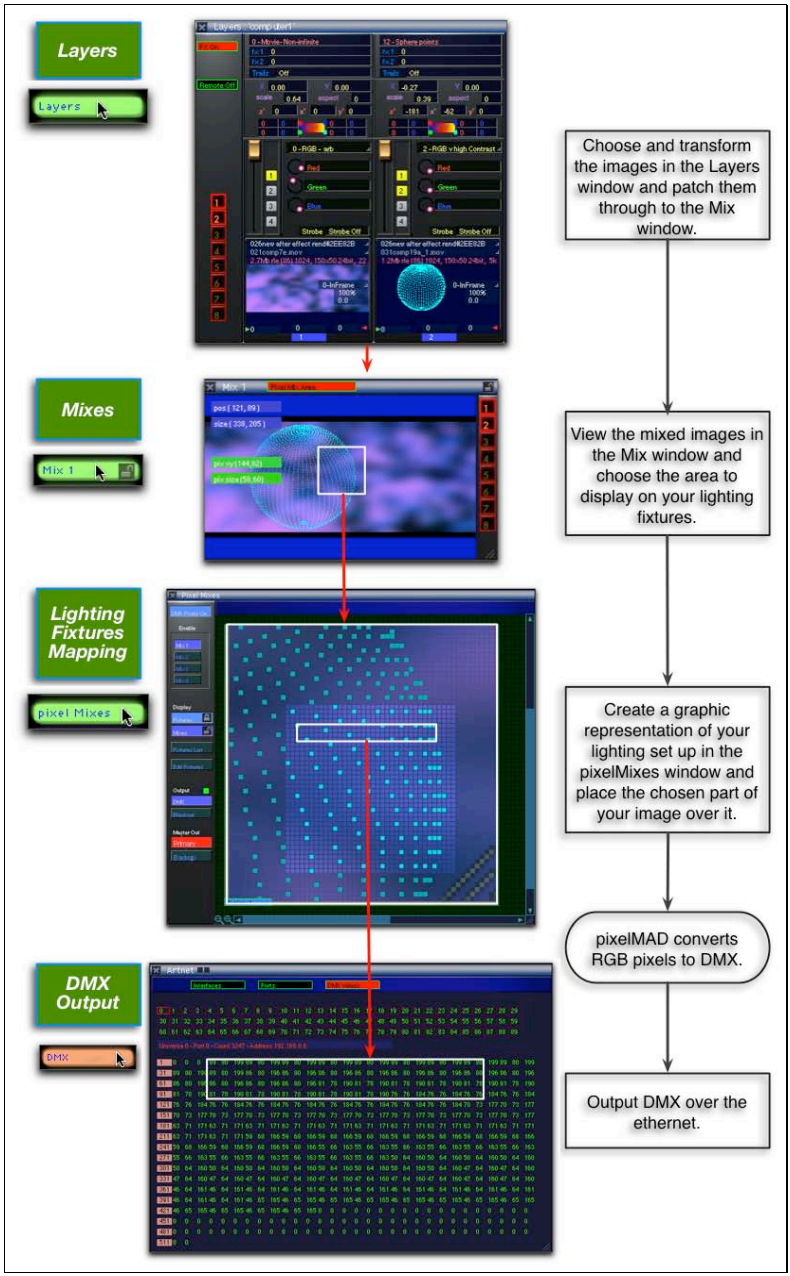

Layers
Layers
Choose and transform the images in the Layers window and patch them through to the Mix window.
Mixes
Mix 1
View the mixed images in the Mix window and choose the area to display on your lighting fixtures.
Lighting Fixtures Mapping
pixel Mixes
Create a graphic representation of your lighting set up in the pixelMixes window and place the chosen part of your image over it.
pixelMAD converts RGB pixels to DMX.
DMX Output
DMX
Output DMX over the ethernet.

Figure 5 – Workflow.

Examples

Example 1

In this example a single image will be displayed on a lighting set up of 8 RGB LED batons and 32 par cans in two grids of 16.

Creating the lighting diagram.

In the PIXEL MIXES window graphic representations of the fixtures can be arranged in a layout similar to that which they will be in on stage.

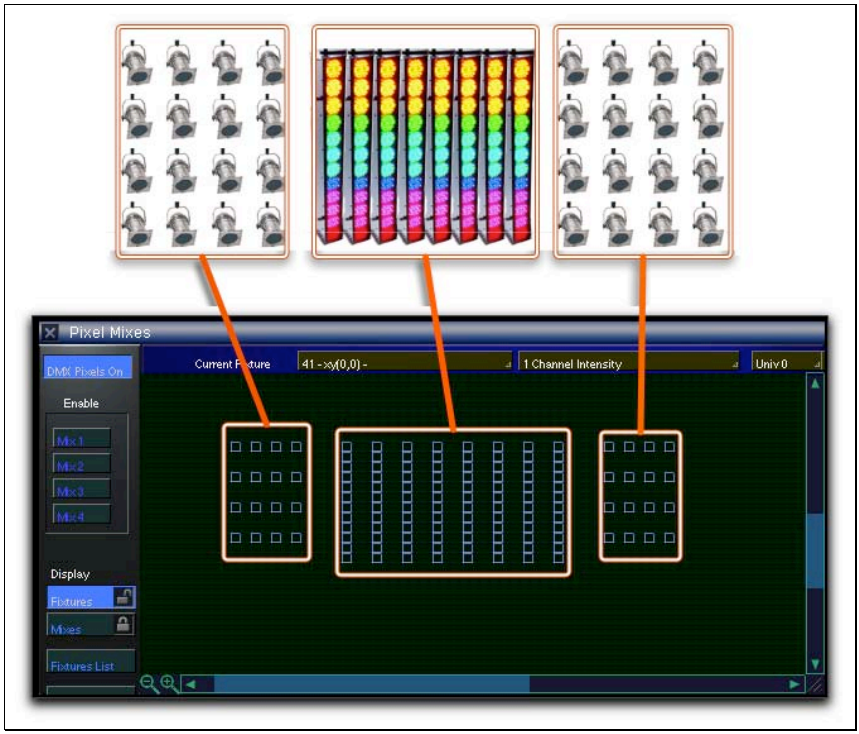


Figure 6 - Lighting Plot.

To create the diagram of your lighting plot click on the FIXTURE LIST button on the left side of the PIXEL MIXES window.

An empty fixture list will open on the right side of the window.

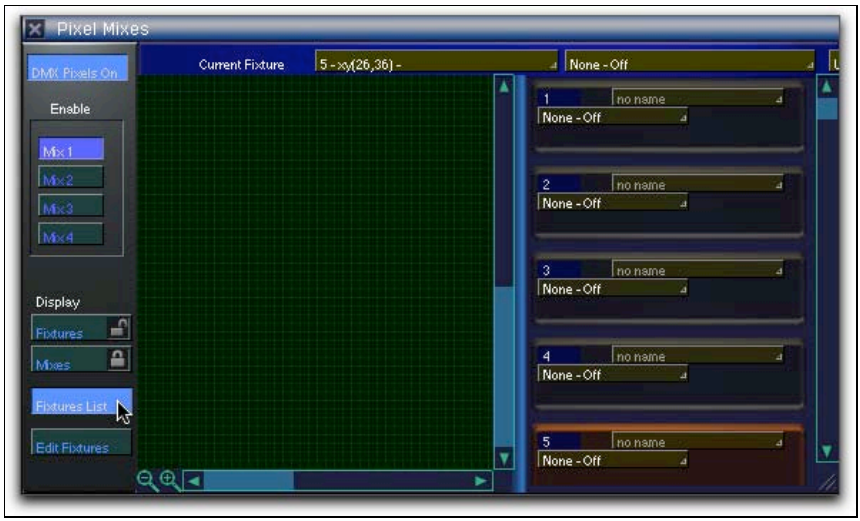


Figure 7 - Empty Fixture List.

To add a fixture to the list, click on the button labelled NONE – OFF.

A list of possible lighting fixtures will open for you to choose your fixture from.

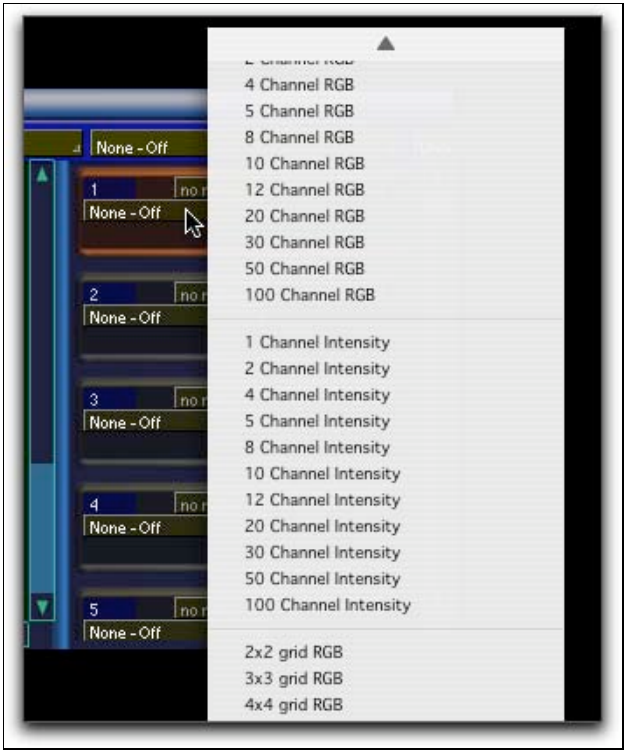


Figure 8 - List of Fixtures.

Click on the lighting fixture that you want to add, and it will be turned on and made active.

Figure 9 - Adding a Fixture to the List.

When you add a fixture to the list a grid representing the number of pixels in the lighting fixture will appear in the bottom left corner of the window.

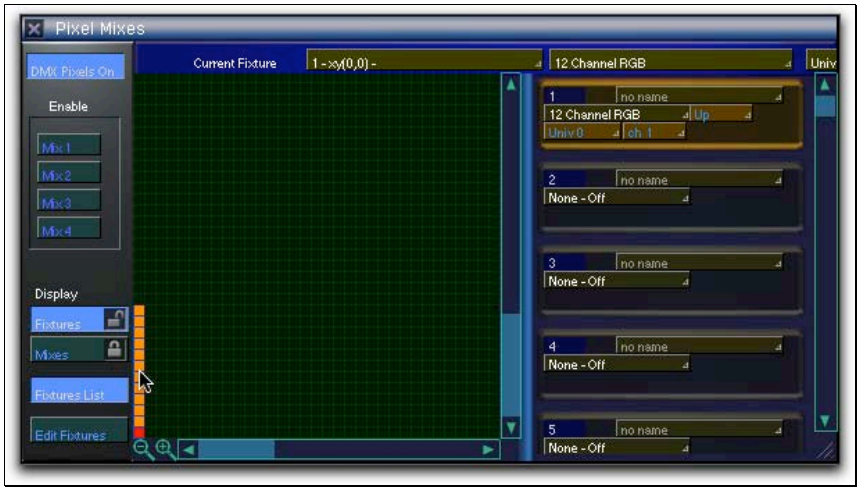


Figure 10 - Adding a Fixture to the Window.

The lighting fixture can be dragged into position.

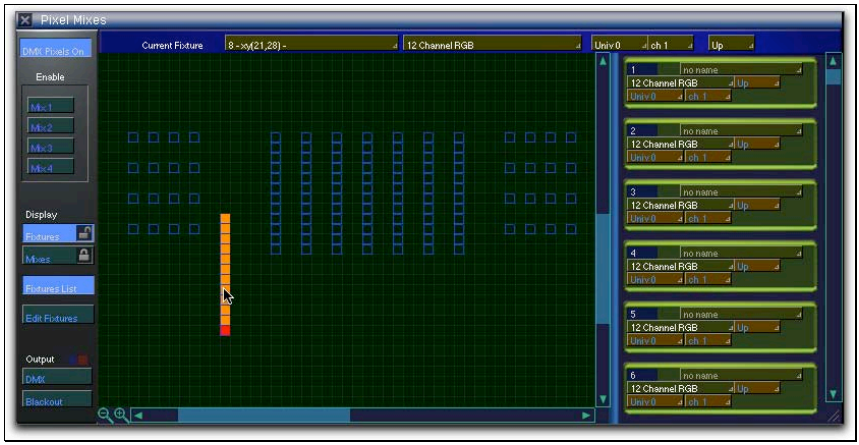


Figure 11 - Dragging a fixture into position.

Information about the fixture position, the universe the orientation and the DMX numbers is shown along the top of the PIXEL MIXES window.

Figure 12 - Current Fixture Information.

Choosing and mixing your images.

Once you have created the diagram of your lighting plot you need to choose the images or movies to display on the lights.

Click on the LIBRARIES button in the HUD of the main full screen window to open up the library and choose your images.

Figure 13 – Library Files.

Here you can also choose from a selection of COLOUR FX and VISUAL FX that can be applied to the images and movies.

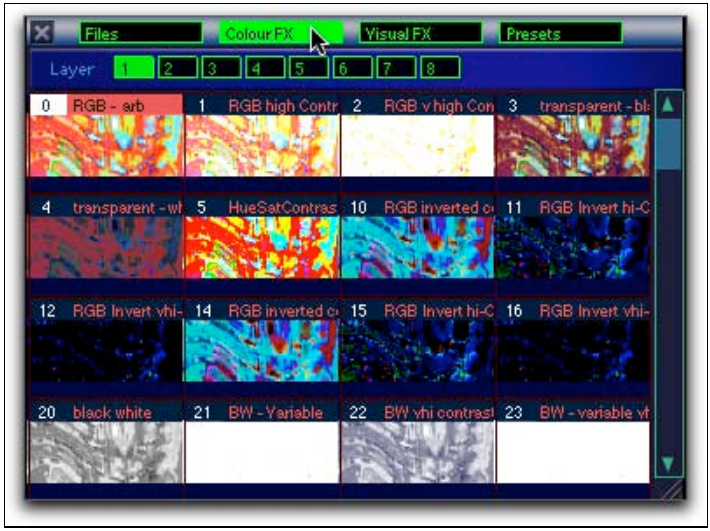


Figure 14 - Colour FX.

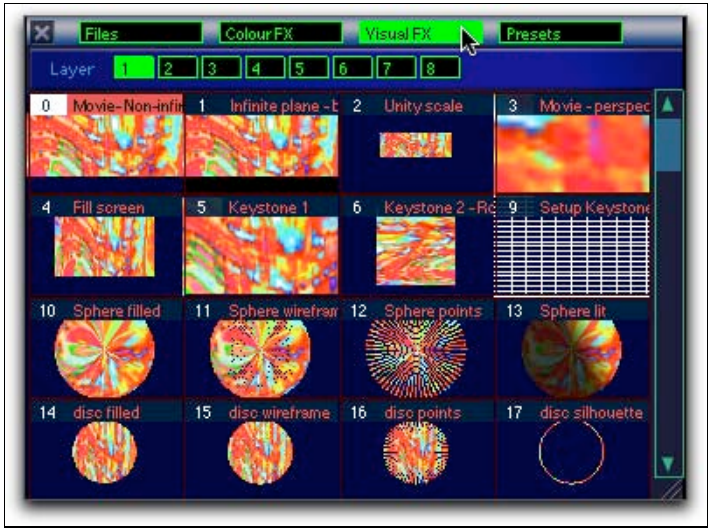


Figure 15 – Visual FX.

In order to make any adjustments to the images they must be patched through to the LAYERS window.
Open the LAYERS window from the HUD, then in the LIBRARY window click on the image you want to use

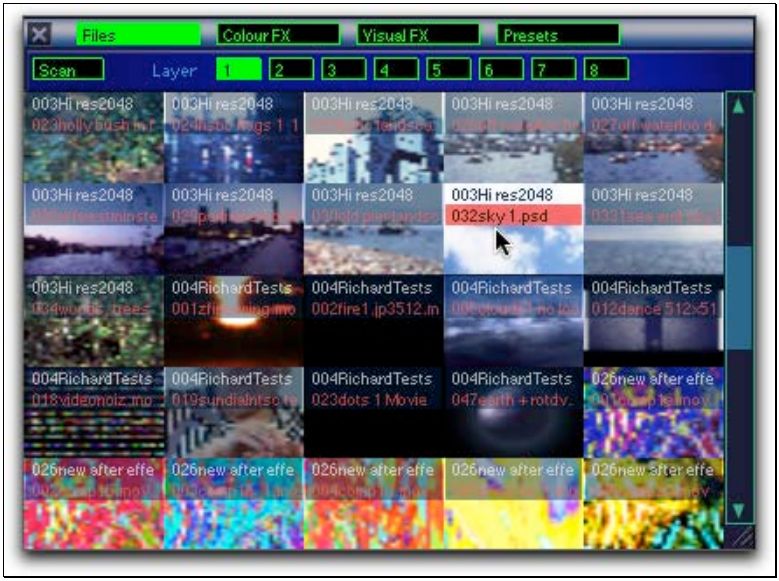


Figure 16 - Choosing an image from the Library.

Click on one of the layers numbered 1 to 8 at the top of the LIBRARY window in order to patch the image through to the corresponding layer in the LAYERS window.

Figure 17 - Patching an image through to a Layer.

Any VISUAL FX required can be added to the same layer as the image in order to change that image.

Once you have chosen your source footage it can be transformed using the file, colour, shape and intensity parameters in the LAYERS window.

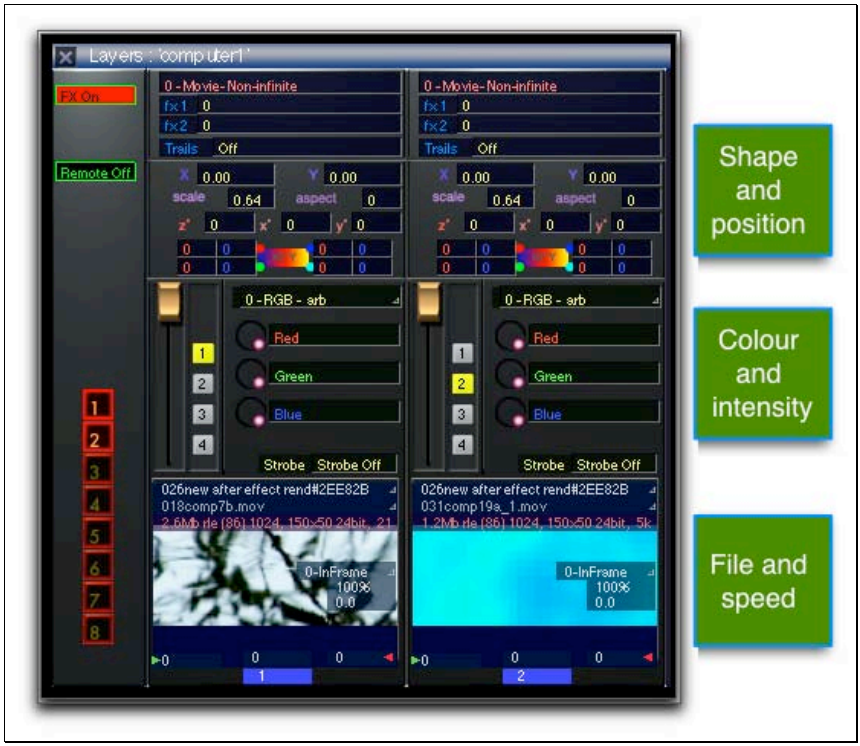


Figure 18 - Layers Window.

In the LAYERS window the following parameters can be altered to create the image you want to send to your lighting fixtures.

File parameters

Figure 19 - File Parameters.

- Click on the FILE

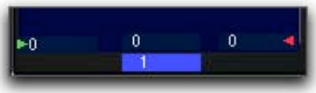
or FOLDER lists

to locate the source image or movie.

- PLAY SPEED 0% to 200% and PLAY MODE

for making loops, setting loop type and changing the speed of the loop.

- IN and OUT points



for changing the loop length.

Colour Parameters

Figure 20 - Colour Parameters.

- INTENSITY and STROBE
- 4 channels for adjusting the RGB content of the image for distorting or altering the colour or creating a mask.
- Mix output select buttons.

Shape Parameters

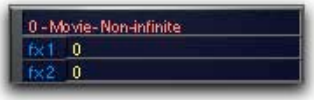
Figure 21 - Shape Parameters.

- POSITION

ROTATION

and SCALE and ASPECT RATIO

- VISUAL FX for mapping the image or movie into different shapes.



- KEYSTONING

When used with a DMX console all modes and all parameters can be accessed and controlled on all layers.
All parameters are controllable per layer via a 40 channel DMX patch.
Both 8 bit and 16 bit parameters are used.

Selecting the output Mix

You can view the image as you transform it in one of the four MIX windows listed in the HUD. Click on the Mix button to open the window.

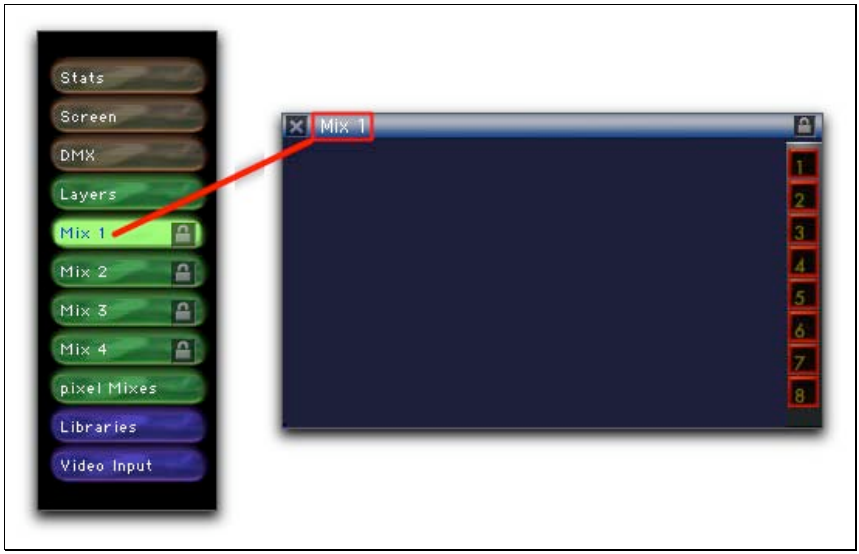


Figure 22 – Opening a Mix Window.

When you first open the Mix window no image will be displayed. Patch the image through from the LAYERS window by giving the layer you are working on the same channel number as the MIX window you have opened.

Figure 23 - Patching an image through from the layers window to the mix window.

The layers which are visible in the Mix window are indicated by the red boxes numbered 1 to 8 down the side of the window.

Figure 24 - Active Layers in the Mix window.

More than one Layer can be placed in the Mix in order to create a composite image.

Figure 25 - Three images layered together in one Mix.

Now you must choose the part of the image in the MIX window that you want to put onto your lights. First unlock the Mix window in the top right hand corner.

Figure 26 - Unlocking the mix window.

Then click on the red button in the MIX window labelled PIXEL MIX AREA so that a rectangular outline appears over your image.

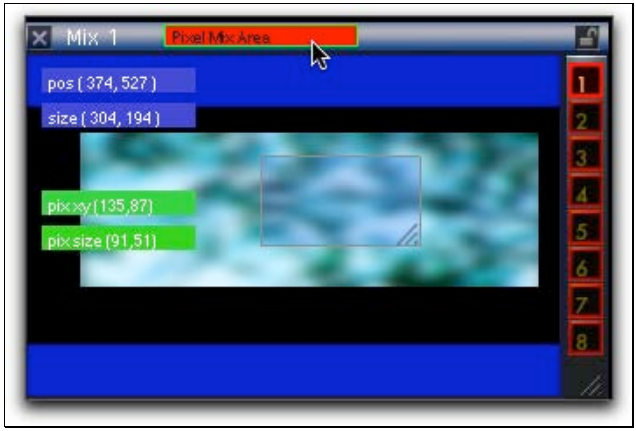


Figure 27 - Opening the Pixel Mix Area.

This can be made larger or smaller by clicking and dragging from the bottom right hand corner of the rectangle. Only the part of the image that you place within this box will be mapped onto the lighting fixtures.

Mapping your images onto the lighting fixtures.

The final step in the process is to place the image you have created onto your lighting plot in the PIXEL MIXES window.

Go to the HUD and open the PIXEL MIXES window. To place the image over your lighting plot click on the MIXES button. This turns on the display of the mixes.

Then enable the mix number that corresponds to the MIX window that contains your image.

Your image will now appear in the PIXEL MIXES window.

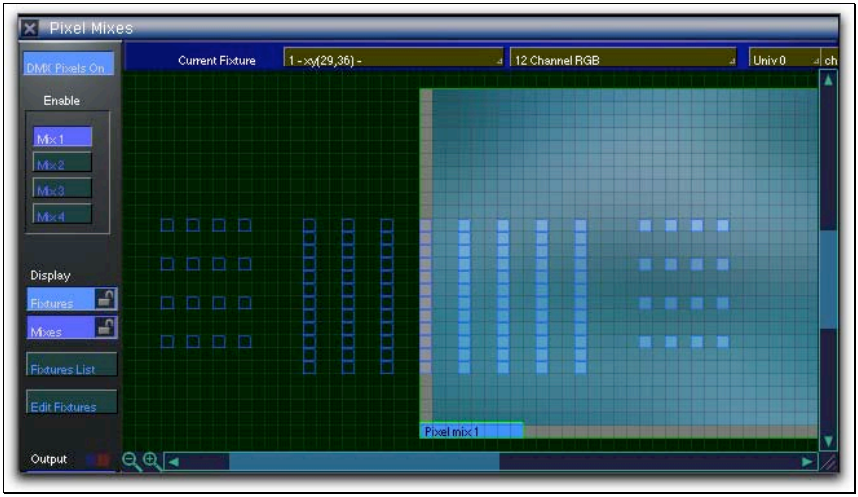


Figure 28 - Mix1 visible in the pixel mixes window.

Unlock the MIXES button in order to drag the window to the desired position over the lighting plot.

You can change the size of the mix window by dragging the top right hand corner of the PIXEL MIX.

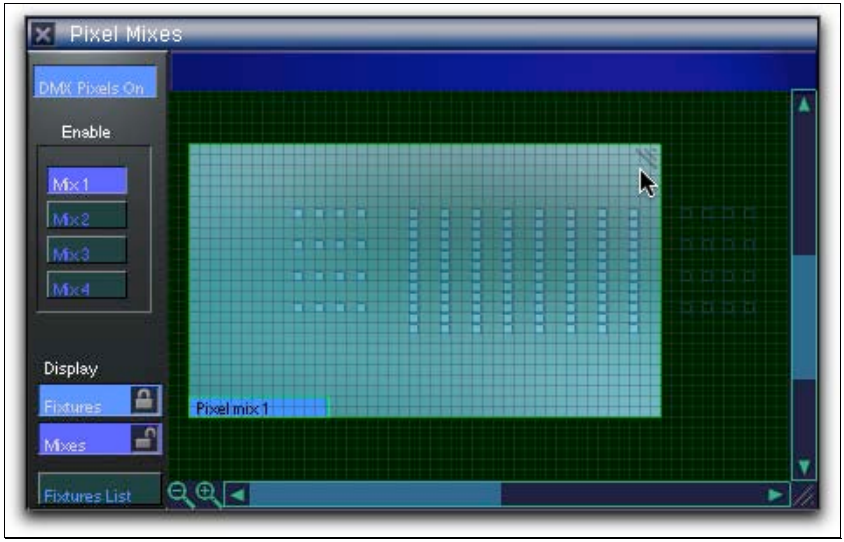


Figure 29 - Changing the size of the Mix area.

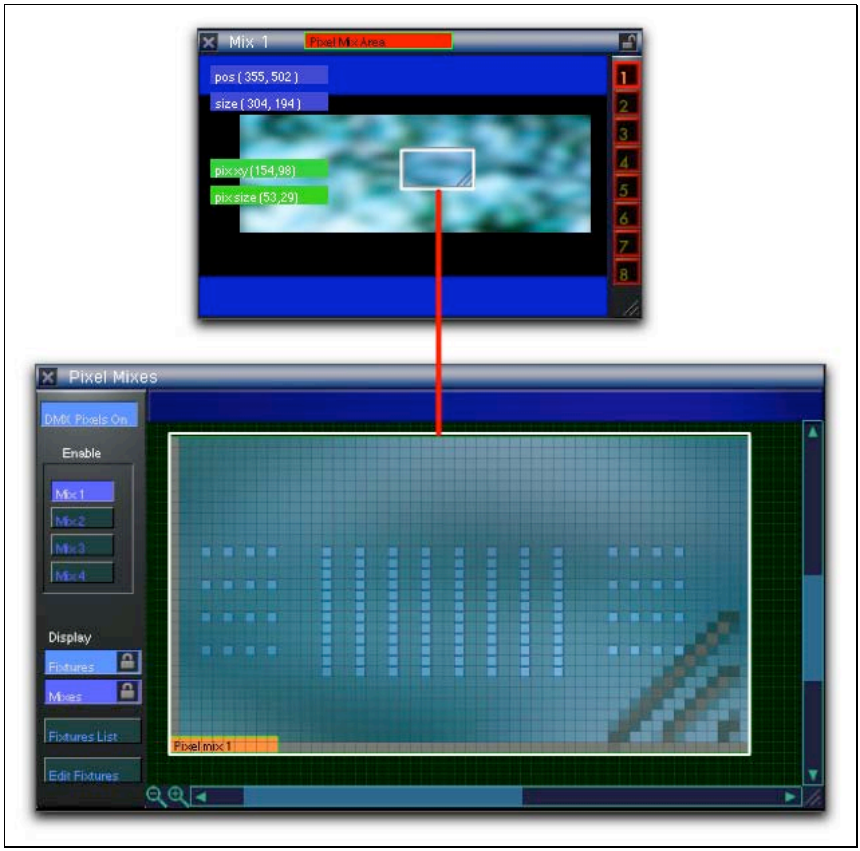


Figure 30 - The pixel mix area is patched through to the pixel mix window and placed over the lighting plot.

Now that the MIXES button is set to on the image will be seen superimposed over the fixture set up. When the Mixes button is set to off then only the parts of the image sent to the lighting fixtures will be shown and you will get some idea of how the image will appear displayed over your lighting fixtures.

Figure 31 - The mixes button set to on and off.

The relationship between the PIXEL MIXES window and the lighting fixtures can be seen in the diagram below. Here the image of a static white rectangle has been placed over 8 parcans and a section of some LED batons. This white rectangle can then be moved across the lighting fixtures using the X and Y position parameters in the LAYERS window.

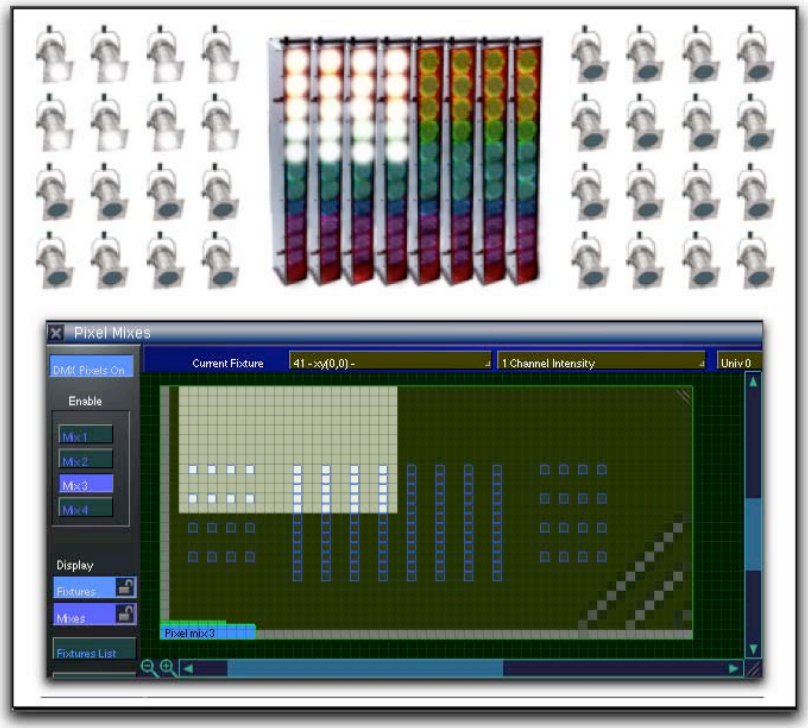


Figure 32 - How the pixel mixes window relates to the lighting fixtures.

Example 2

This example shows how multiple image mixes can be displayed over different groups of lighting fixtures.

Select your images or movies in the LIBRARY window and patch them through to the LAYERS window. Then open three MIX windows from the HUD.
Patch the images through from the LAYERS window to the MIX windows using the four channel buttons in each of the layers in the Layers window.

Now that the MIXES button is set to on the image will be seen superimposed over the fixture set up. When the Mixes button is set to off then only the parts of the image sent to the lighting fixtures will be shown and you will get some idea of how the image will appear displayed over your lighting fixtures.

Figure 31 - The mixes button set to on and off.

Now click on the Pixel mix area in each of the three MIX windows and choose the area of the images that you want to patch through to the PIXEL MIXES window and then on to the lighting fixtures.

To view the three mixes superimposed over your lighting plot in the PIXEL MIXES window turn on the MIXES button.

Then enable Mix 1, 2 and 3.

The images from the MIX windows will now appear superimposed over your lighting plot.

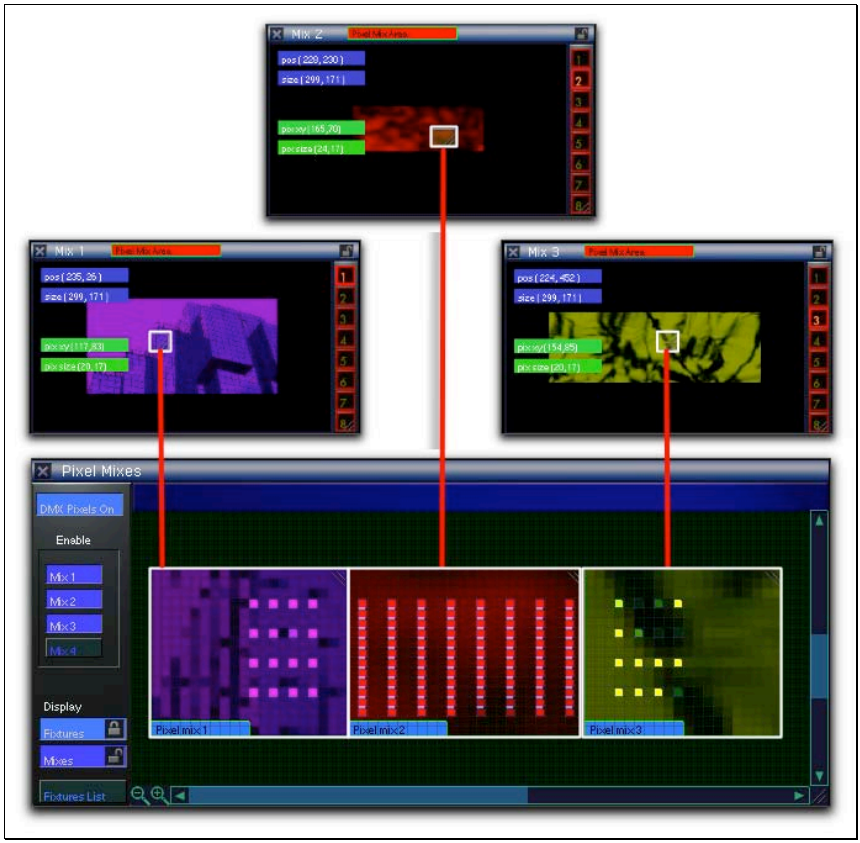


Figure 34 - The relationship between the pixel mix area in the Mix windows and the Pixel Mixes window.

To drag the images into position you must unlock the MIXES button in the PIXEL MIXES window.

When you have finished moving the mixes click on the MIXES LOCK button. This will lock the mixes in position.

The diagram below shows the three separate PIXEL MIX AREAS placed over the diagrams representing three different sets of lighting fixtures.

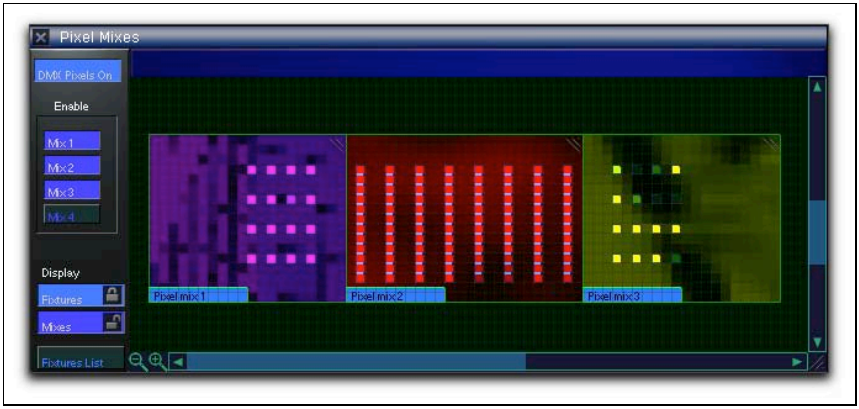


Figure 35 - Pixel Mixes window with Mixes button set to on.

If you turn off the Mixes button in the PIXEL MIXES window only the part of the image that is displayed by the lighting fixtures will be shown on the screen giving you some idea of how the image will look displayed on your lighting fixtures.

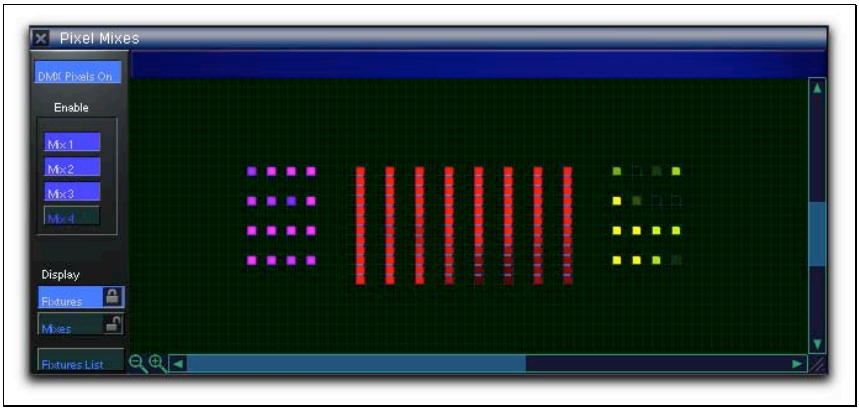


Figure 36 - Pixel Mixes window with the Mixes button set to off.

Example 3

Low resolution video devices such as VersaTile, G-Lec, Barco Mi-pix have come onto the market. They work at low pixel resolutions of around 100 x 100 video pixels. These devices take the DVI or VGA input straight from the computer and their software allows any screen pixel to be displayed anywhere in their pixel world. If you use a DVI buffer the same screen output can be displayed from pixelMad to multiple output devices.

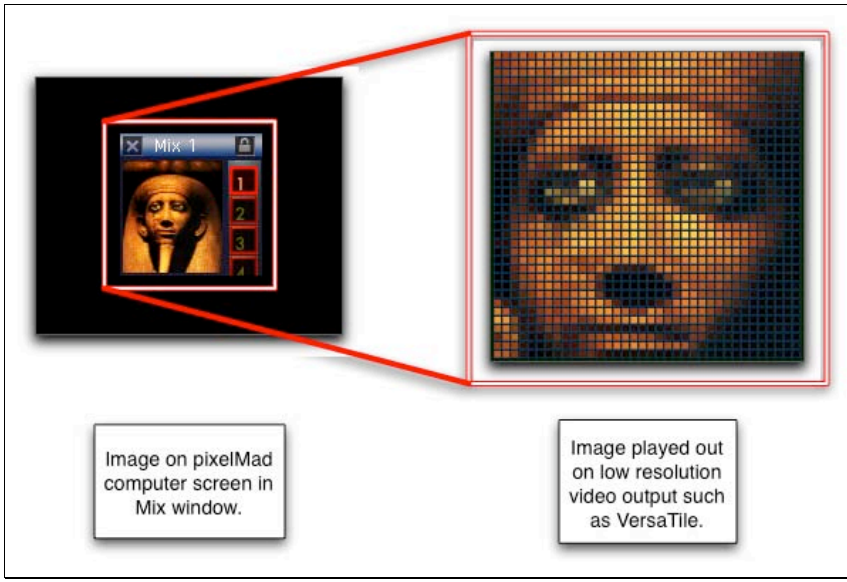

Mix 1
1
2
3
Image on pixelMad computer screen in Mix window.
Image played out on low resolution video output such as VersaTile.

Figure 37- pixelMad sending an image to a low resolution video device.

When playing video images to low resolution devices the entire MIX window will be output through the video device. The Mix window can be resized to match the number of pixels on the low resolution device. Size and position coordinates are displayed in the Mix window and can be adjusted here.

Figure 38 - Mix window unlocked showing size and position coordinates.

When you are happy with the positioning and size of the image then the MIX window must be locked to remove the information bars as these will also show up on the output device.

Figure 39 - Mix window locked.

Four movies can be played simultaneously from the screen as shown in Figure 31. Here the Mix windows have been locked to remove all information bars.

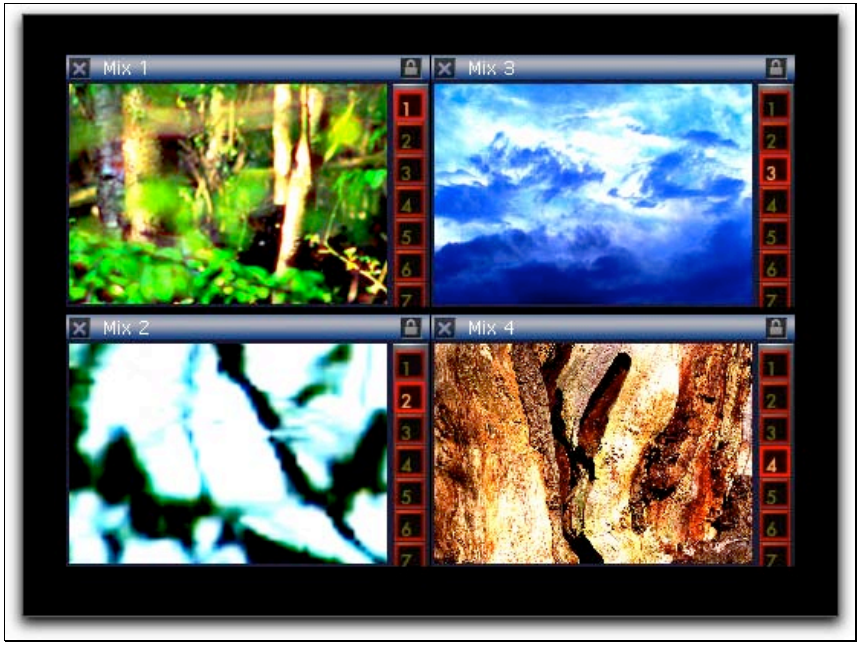


Figure 40 - pixelMad playing four movies simultaneously in 4 separate Mix windows.

pixelMad has a special VISUAL FX mode called UNITY SCALE which completely preserves the pixel size of the source image whatever the size of the output.

If the image is 150 by 50 pixels and UNITY SCALE is applied, the image will appear this size on the output device no matter what is done to resize the MIX window. Figure 32 shows a clip that has had unity scale applied to it. The image size remains 150 by 50 pixels even though the window is resized.

Figure 41 - Unity scale preserves the image size even when the mix window is resized.

UNITY SCALE can be found in the visual FX presets in the LIBRARY window.

Figure 42 - Unity Scale

Chapter 2 – Organising Quicktime Movies.

pixelMAD plays back Quicktime movies, and displays most common image types supported by Quicktime up to a maximum size of 2048x2048.

Apple's Quicktime information page is at http://www.apple.com/quicktime/whyqt/

Movies and images are stored in numbered files. All files and folders have a 3-digit number prefix between 000 and 255.

These numbers correspond to the DMX values for the LIBRARY FOLDERS and FILES within those folders.
For example: File "019 fairground old pier 1.mov" in Folder "003 Hi res2048" will appear when FILE DMX value 19, LIBRARY DMX value 3 is selected on the lighting console.

A common folder and file setup is shown in below.

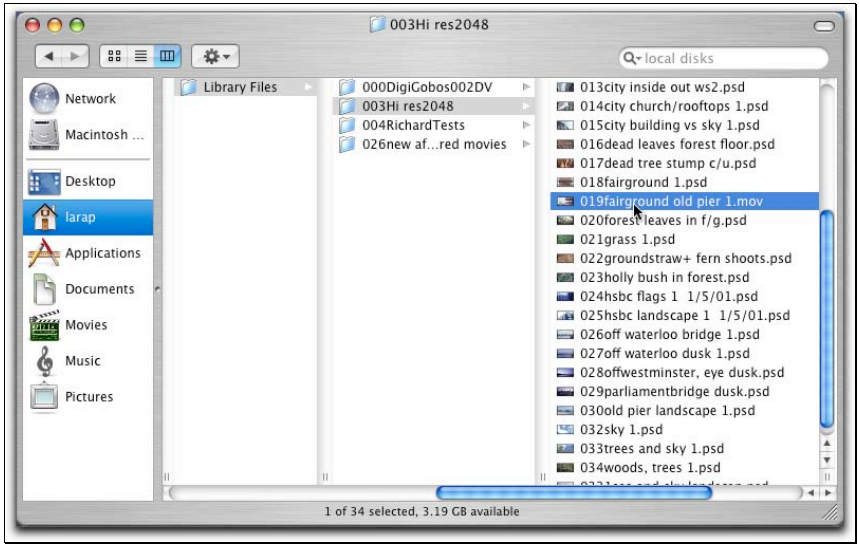
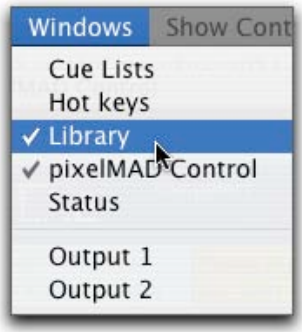


Figure 43 - Library Folders and Files.

To set up the image folders select the LIBRARY window.



Then click on one of the eight folder location slots.

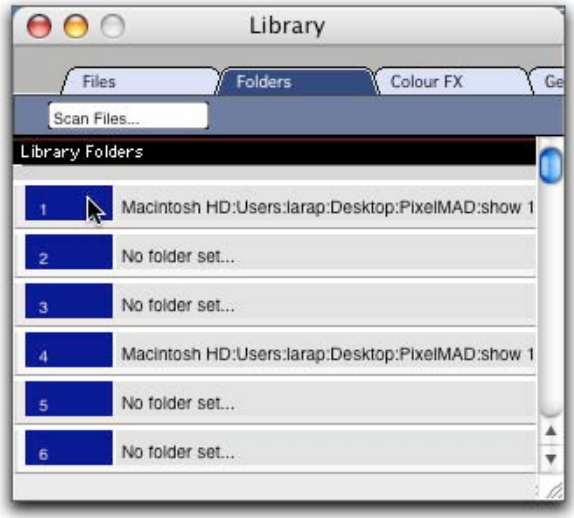


Figure 44 - Library Folders.

Select the folder containing the numbered folders – in this case the LIBRARY FILE.

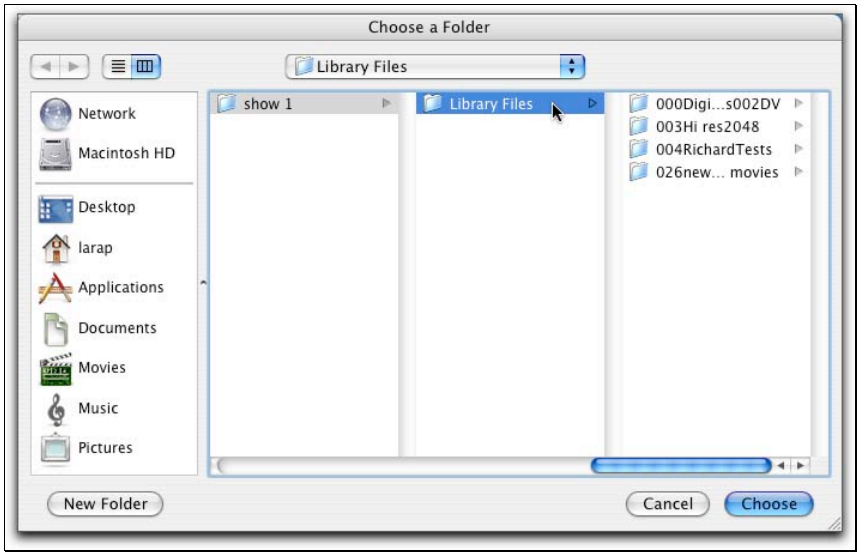


Figure 45 - Choosing the library folder

After setting the folder click on scan files to create a list of all of your movies.

Once the files have been scanned click on the FILES tab to see your list of image files.

Figure 46 - Library Files.

You can also scan the files from the HUD LIBRARY window.

Figure 47 - Image thumbnails after scan.

Chapter 3 – ArtNet Getting Data To Fixtures

Configuring Ethernet & ArtNet

Data is routed from pixelMAD to the DMX fixtures using an Artnet device on an Ethernet network.

Artnet devices are connected using a standard network hub or switch.

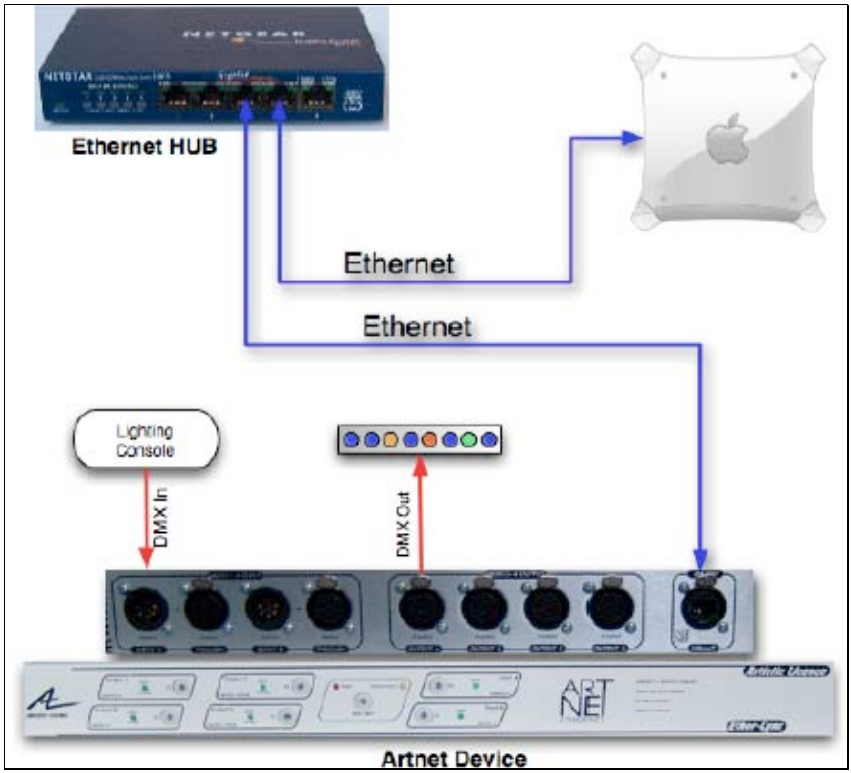
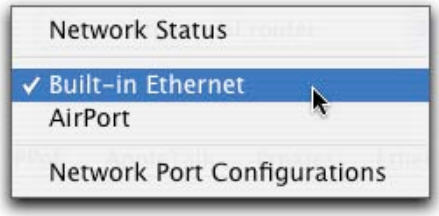


Figure 48 – Ethernet configuration

To send and receive data to ArtNet devices the TCP/IP address of the Apple Macs network adapter must be set.

Open the Network settings-
APPLE>SYSTEM PREFERENCES>NETWORK.

Select BUILT-IN ETHERNET



Enter the settings as shown below and apply them.

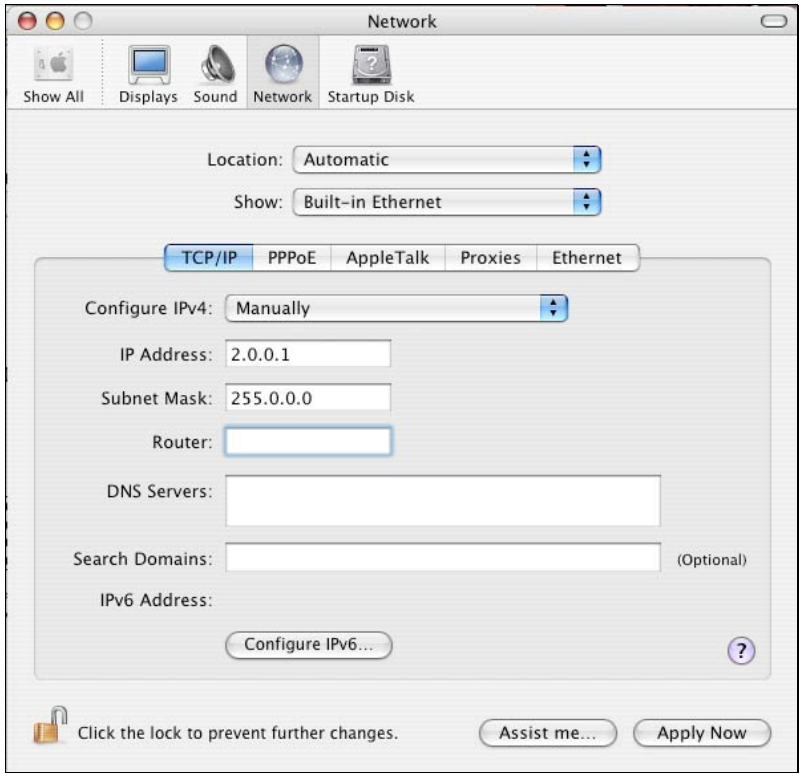


Figure 49 – TCPIP Network preferences

Once the TCP/IP settings are set, pixelMAD will detect any ARTNET devices on the network and show the ports.

Figure 50 – TCPIP settings

Open the DMX window from the HUD. Select the INTERFACES or PORTS button to see which ArtNet devices are on the network.

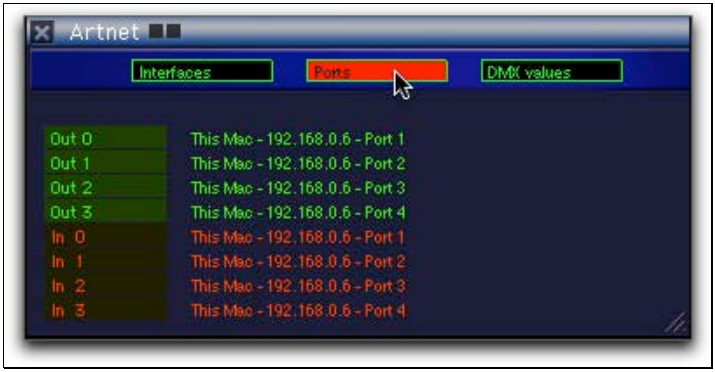

Artnet
Interfaces
Ports
DMX values
Out 0 This Mac - 192.168.0.6 - Port 1
Out 1 This Mac - 192.168.0.6 - Port 2
Out 2 This Mac - 192.168.0.6 - Port 3
Out 3 This Mac - 192.168.0.6 - Port 4
In 0 This Mac - 192.168.0.6 - Port 1
In 1 This Mac - 192.168.0.6 - Port 2
In 2 This Mac - 192.168.0.6 - Port 3
In 3 This Mac - 192.168.0.6 - Port 4

Figure 51 - Artnet Ports.

Configuring DMX Communication

Use the DMX Input control panel as shown below to configure the Artnet universe and DMX address for each layer.

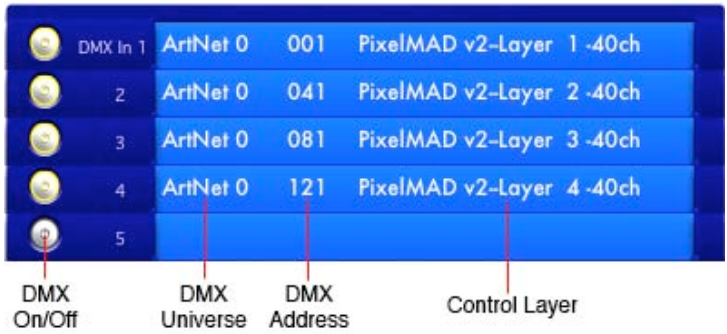


Figure 52 – Addressing pixelmad layers

Chapter 4 – DMX Spec Reference

Some features may or may not be included.

Channel	Usage	Default value
1	Library Folder	0
2	Library File	0
3 & 4	In point	0
5 & 6	Out point	0
7	Play mode	0
8	Play speed	0
9 & 10	X rotation	32768
11 & 12	Y Rotation	32768
13 & 14	Z rotation	32768
15 & 16	Image size	36864
17 & 18	X position	32768
19 & 20	Y position	32768
21	Aspect ratio	0
22	Movement speed	0
23	Intensity	0
24	Red Parameter	255
25	Green Parameter	255
26	Blue Parameter	255
27	Strobing	0
28	Trails	0
29	Colour FX	0
30	Visual Geometry FX	0
31	Visual FX Parameter 1	0
32	Visual FX Parameter 2	0
33	Keystone X1	128
34	Keystone Y1	128
35	Keystone X2	128
36	Keystone Y2	128

37	Keystone X3	128
38	Keystone Y3	128
39	Keystone X4	128
40	Keystone Y4	128

Image source Folder

Ch 1 Folder	*Usage*	*Comments*
0- 253	Selects Library Folder	
254	Use Layer Mode	
255	Select Video input	

Image source File

Ch 2 File		*Usage*	*Comments*
Ch1 in Library mode	***0- 255***	Selects Library File in folder	
Ch1 in 'Use Layer Mode'	***0***	Selects Layer 1	
	1	Selects Layer 2	
	2	Selects Layer 3	
	3	Selects Layer 4	
Ch 1 in Video Input Mode	***0***	Selects video input 1	
	1	Selects video input 2	

Inpoint

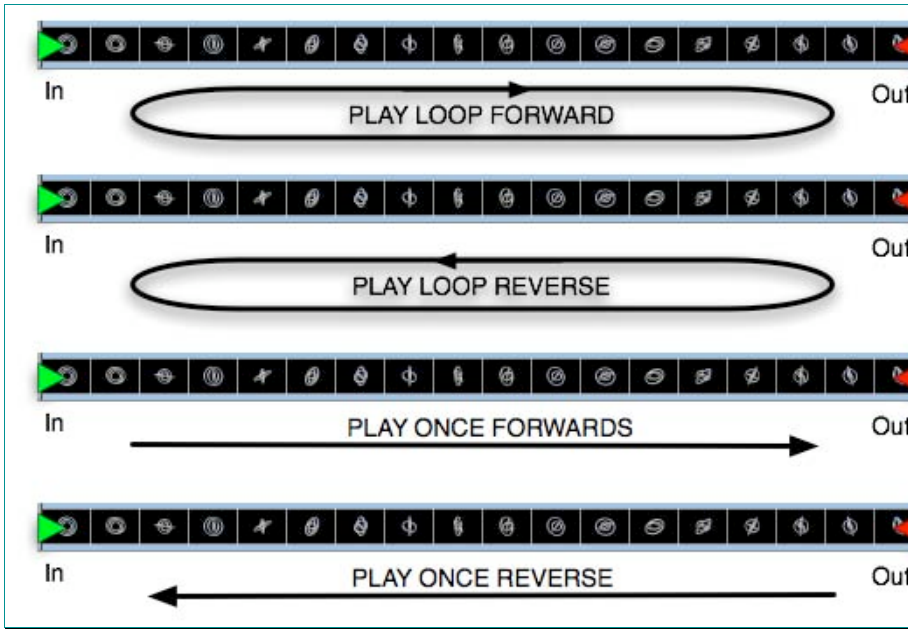
Ch 3&4 Inpoints	*Usage*	*Comments*
0- 65535	Selects in point	Video looping in point – see Playmode

Outpoint

Ch 5&6 Outpoints	Usage	Comments
0- 65535	Selects out point	Video looping out point – see playmode

Playmode

Ch 7 - Playmode	Usage	Comments
0	Display frame at inpoint	
1	Display frame at outpoint	
2	Play Looping forwards	Play between in point and out point
3	Play Looping reverse	Play between in point and out point
4	Play Once forward	Single shot play forwards
5	Play Once Reverse	Single shot play reverse
6	Stop	
7	Random	Play a random frame
8	Play sine	Bounce between in and out points
10	Play Looping forwards Intersity > 0	Play between inpoint and outpoint
11	Play Looping reverse Intensity > 0	Play between inpoint and outpoint
12	Play Once forward Intensity > 0	Single shot play forwards
13	Play Once Reverse Intensity > 0	Single shot play reverse
14	Random Intensity > 0	Play a random frame
15	Play sine Intensity > 0	Bounce between in and out points
20	Sync to MTC clock Time	Use midi time code clock time
30	Sync to Sony deck 1 clock Time	Use sony deck clock time
31	Sync to Sony deck 2 clock Time	Use sony deck clock time
32	Sync to Sony deck 3 clock Time	Use sony deck clock time
80 - 99	Sync to master ID	



Playspeed

Ch 8 - Playspeed	*Usage*	*Comments*
0	100%	
1	Pause	
2 - 255	1 – 200%	

Image Rotation

Ch 9 & 10	*Usage*	*Comments*
X Rotation	See Diagram below	

Ch 11 & 12		
Y Rotation	See Diagram below	
Ch 13 & 14		
Z Rotation	See Diagram below	

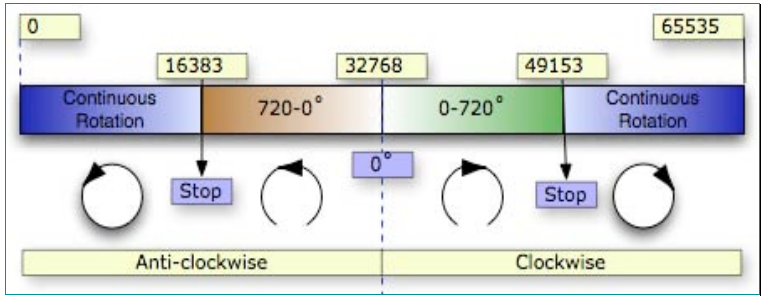


Image Scale

Ch 15 & 16 - scale	*Usage*	*Comments*
Image Scale	See Diagram below	

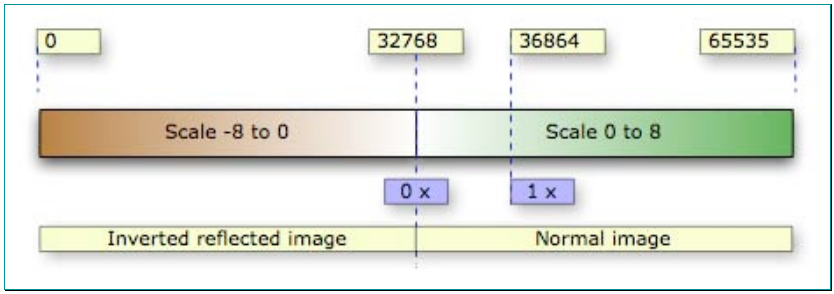
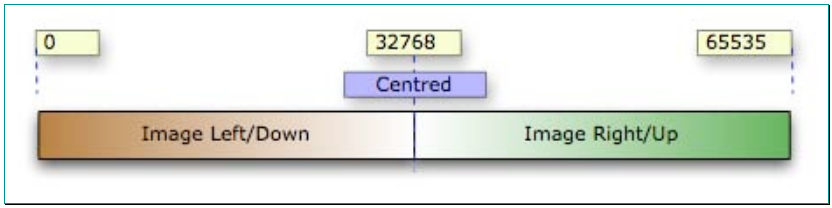
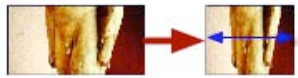
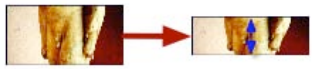


Image Position

Ch 17 & 18	*Usage*	*Comments*
X Position	See Diagram below	
Ch 19 & 20		
Y Position	See Diagram below	



Aspect Ratio

Ch 21 – Aspect ratio	*Usage*	*Comments*
0 -128		Image Compressed horizontally
129-255		Image Compressed Vertically

Movement Speed

Ch 22 – Movement speed	Usage	Comments
0 -255	Damping Factor	Use when panning or zooming around image to make movement smoother

Intensity

Ch 23 - Intensity	Usage	Comments
0 -255	Layer Intensity or transparency	Opacity of Layer

Red Green Blue

Ch 24 25 26	Usage	Comments
Red	Depends on Colour FX	
Green	Depends on Colour FX	
Blue	Depends on Colour FX	

Strobe

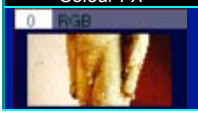
Ch 27 - Strobe	Usage		Comments
0	Strobe Off		No strobing
1 - 24	On Off Fast - slow		Even On Off Time

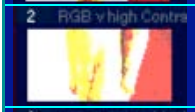
25 - 49	Pulse 1		Time between pulses varies. Pulse Length always 1 frame long
50 - 74	Pulse 2		Pulse length varies. Time between pulses 25 frames
75 - 99	Pulse Train		Pulse number varies. Time between pulse group is 25 frames
100 - 124	Random 1 – even on off time.		Even on off pulse, length of pulse varies randomly.
125 - 149	Random 1 – single frame pulse.		Pulse length always 1 frame. Time between pulses is random.

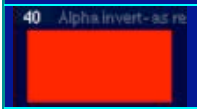
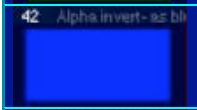
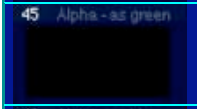
Trails

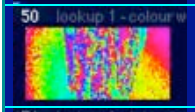
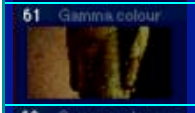
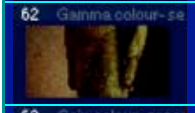
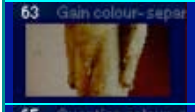
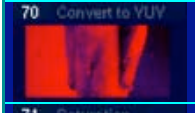
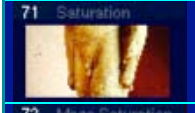
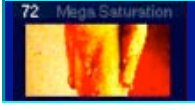
Ch 28 - Trails	*Usage*	*Comments*
0 -255	Image Trails	Only really works on layer 1

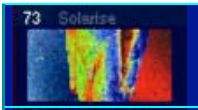
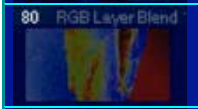
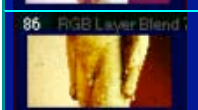
Colour FX

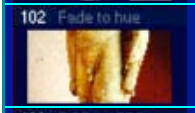
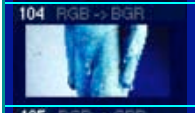
Ch 29 Colour FX	*Name*	*Ch 24 R*	*Ch 25 G*	*Ch 26 B*	*Comments*
	RGB Mix	Red	Green	Blue	

	RGB High Contrast	Red	Green	Blue	
	RGB V hi contrast	Red	Green	Blue	
	Transparent black	Red	Green	Blue	Transparent
	Transparent white	Red	Green	Blue	Transparent
	RGB Invert	Red	Green	Blue	
	RGB Invert hi-con	Red	Green	Blue	
	RGB Invert v hi-con	Red	Green	Blue	
	Invert whatever	Red %	Green %	Blue %	Transparent
	Black & white	.	.	.	
	BW variable	Red %	Green %	Blue %	Transparent
	BW hi-con	.	.	.	Transparent
	BW variable hi-con	Red %	Green %	Blue %	Transparent

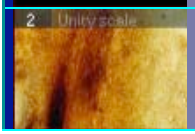
	Invert BW	Red %	Green %	Blue %	Transparent
	Mask	Mask %			Transparent No Fading
	Invert Mask 1	Mask %			Transparent No Fading
	Invert Mask 2	Mask %			Transparent No Fading
35	Mask - Fading	Mask %			Transparent
36	Invert Mask 1- Fading	Mask %			Transparent
37	Invert Mask 1- Fading	Mask %			Transparent
	Alpha Invert -Red	.	.	.	
	Alpha Invert - Green	.	.	.	
	Alpha Invert - Blue	.	.	.	
	Alpha Invert - Colour	Red	Green	Blue	
	Alpha – as Red	.	.	.	
	Alpha – as Green	.	.	.	
	Alpha – as Blue	.	.	.	

	Alpha – as Colour	Red	Green	Blue
	Lookup 1 – color hue	Red %	Green %	Blue %
	Lookup 2 – false color	Red %	Green %	Blue %
	Lookup 3 - solarize	Red %	Green %	Blue %
	Gamma bw	bw gamma		
	Gamma color	gamma		
	Gamma col sep channels	red gamma	green gamma	blue gamma
	Gain – color – sep channels	red gain	green gain	blue gain
	Quantise color	red quantise	green quantise	blue quantise
	Convert to YUV	Red	Green	Blue
	Saturation	saturation		
	Mega saturation	saturation		

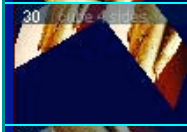
	Solarise	Red	Green	Blue	
	Solarise invert	Red	Green	Blue	
	RGB layer blend 1	Red	Green	Blue	Layer Mode
	RGB layer blend 2	Red	Green	Blue	Layer Mode
	RGB layer blend 3	Red	Green	Blue	Layer Mode
	RGB layer blend 4	Red	Green	Blue	Layer Mode
	RGB layer blend 5	Red	Green	Blue	Layer Mode
	RGB layer blend 6 -add	Red	Green	Blue	Layer Mode
	RGB layer blend 7 -subtract	Red	Green	Blue	Layer Mode
	RGB layer blend 10 -Max	Red	Green	Blue	Layer Mode
	RGB layer blend 11 – add 2	Red	Green	Blue	Layer Mode
	RGB layer blend 12 – invadd2	Red	Green	Blue	Layer Mode

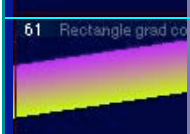
	Tint	red tint	green tint	blue tint	
	Tint inverse	red tint	green tint	blue tint	
	Fade to hue	Fade %	Hue	-	
	RGB -> GBR	Red	Green	Blue	
	RGB -> BGR	Red	Green	Blue	
	RGB -> GRB	Red	Green	Blue	

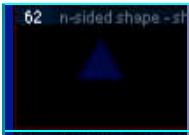
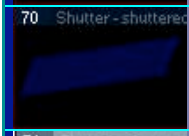
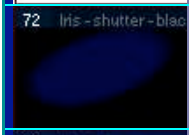
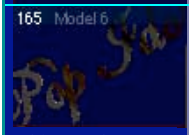
Visual Shape FX

Ch 30 *FX*	*Name*	*Ch 31* *Param 1*	*Ch 32* *Param 2*	*Comments*
	Movie – non-infinite plane	-	-	
	Movie – infinite plane	-	-	
	Unity Scale	-	-	

	Movie - Perspective	Field Of View	Camera	
	Keystone 1	·	·	Keystone channels active
	Keystone 2 - rotatable	·	·	Keystone channels active
	Setup Keystone 1	·	·	Keystone channels active
	Sphere solid	·	·	
	Sphere wireframe	·	·	
	Sphere points	·	·	
	Sphere – with lighting	·	·	
	Disc solid	·	·	
	Disc Wireframe	·	·	

	Disc points	·	·
	Disc Silhouette	·	·
	Kaleidoscope	·	·
	Magic Lantern 1	Aspect Ratio	Movie Count
	Stretch 1	Start	Stretch
	Panorama slices	X slices	
	Magic Lantern 2	Aspect Ratio	Movie Count
	Cube – 4 sides	·	·
	Cube 6 sides	·	·
	Cube 6 sides + colour	·	·

	Cube – first 4 layers	.	.	
	Tile 1	X Tile Count	Y Tile Count	
	Tile 4 – Random colour	X Tile Count	Y Tile Count	
	Tile 5 - consequetive	X Tile Count	Y Tile Count	
	Tile 6 – random colour	X Tile Count	Y Tile Count	
	Tile 7 – Random frame	X Tile Count	Y Tile Count	
	Random flicker	.	.	
	Random colour filcker	.	.	
	Rectangle – plain colour	.		Keystone channels active
	Rectangle – gradient colour	Top Hue	Bottom Hue	Keystone channels active

	n-sided shape	Side Count	
	Shutter - black	. .	Keystone channels active
	Shutter - colour	. .	Keystone channels active
	Iris - shutter	Softness	
	Teapot	.	
	Coloured Sphere	.	
	Spectrograph	Waveform	Uses Sound Input t show waveforms
	Models -OBJ format	. .	
160 - 179			

Param 1 Param 2

Ch 31 - Param 1	Usage	Comments
0 - 255	Depends on Visual FX. See table above	

Ch 32 – Param 2	Usage	Comments
0 - 255	Depends on Visual FX. See table above	

Keystone – shutter channels

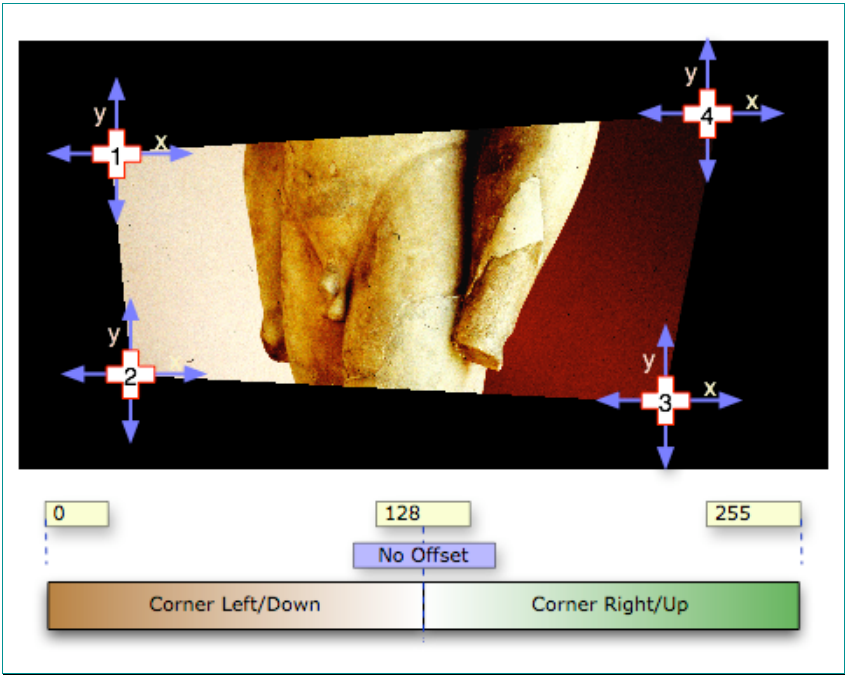
These channels are only active in visual effects with the

Keystone

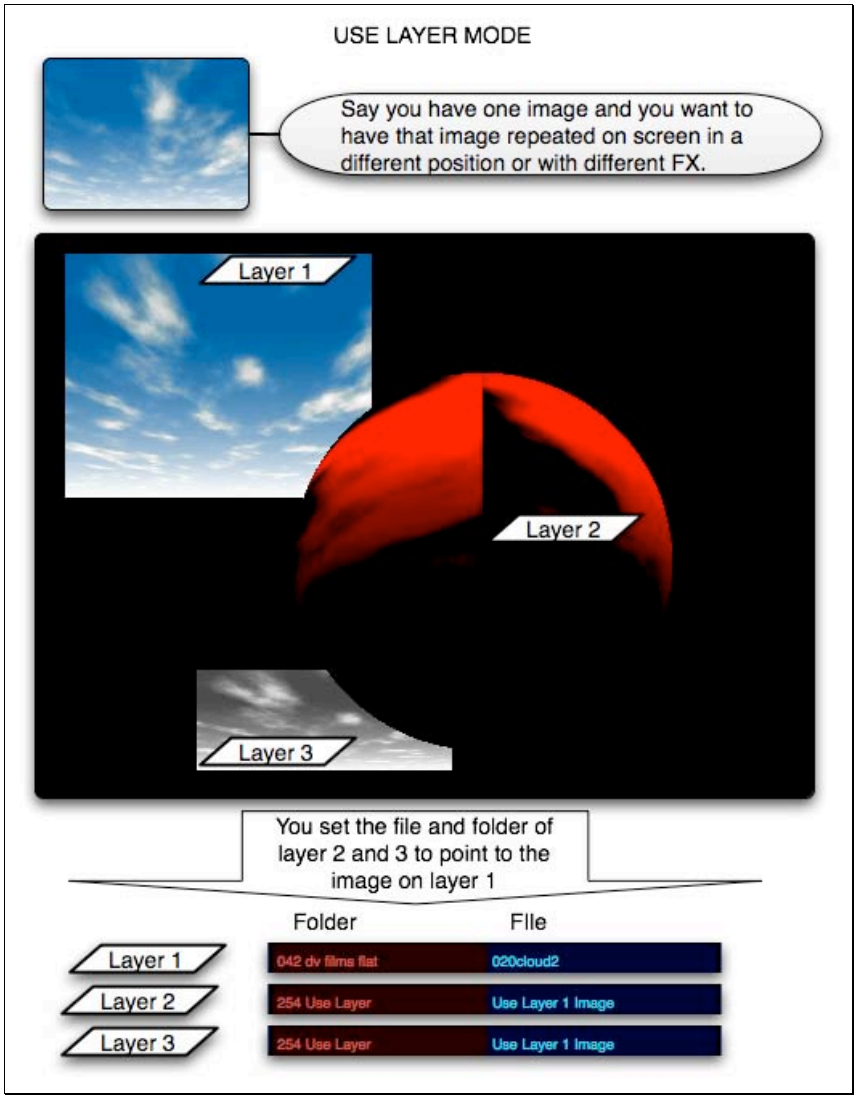
Flag.
Visual FX 5 8 9

Ch 33 – X1	Usage	Comments
0 - 255	See diagram below	Only active in Visual effects with Keystone
Ch 34 – Y1		
0 - 255	See diagram below	Keystone
Ch 35 – X2		
0 - 255	See diagram below	Keystone
Ch 36 – Y2		
0 - 255	See diagram below	Keystone
Ch 37 – X3		
0 - 255	See diagram below	Keystone
Ch 38 – Y3		
0 - 255	See diagram below	Keystone

Ch 39 – X4		
0 - 255	See diagram below	**Keystone**
Ch 40 – Y4		
0 - 255	See diagram below	**Keystone**



Use Layer Mode


USE LAYER MODE
Say you have one image and you want to have that image repeated on screen in a different position or with different FX.
Layer 1
Layer 2
Layer 3
You set the file and folder of layer 2 and 3 to point to the image on layer 1
Folder
FIle
Layer 1
042 dv films flat
020cloud2
Layer 2
254 Use Layer
Use Layer 1 Image
Layer 3
254 Use Layer
Use Layer 1 Image